JOURNAL
OF THE
Association *of* American Medical Colleges

Volume 17 MAY, 1942 Number 3

A Course in Aviation Medicine for Medical Students*

BENJAMIN F. JONES
Passed Assistant Surgeon, United States Public Health Service
Washington, D. C.

Events of the past two years have led to a spectacular rise in interest in aviation medicine. This is reflected in the increasing number of publications of all kinds dealing with the medical aspects of flying, including scientific books and papers, popular novels, magazines, newspapers and even motion pictures. The duty of the flight surgeon is epitomized by the motto which we see everywhere about us, "Keep 'em Flying."

A survey of the teaching of aviation medicine in the United States reveals recently increased activity in this field. Last year, several medical schools gave courses in aviation medicine or aviation physiology, and this year the list has grown. The Mayo Clinic, and other medical centers, have given graduate instruction in the form of review courses or symposia in aviation medicine, in addition to research on important problems in the field. Colonel David Grant, Chief of the Medical Division in the Office of the Chief of the Air Corps, U. S. Army, reported to the Aero Medical Association last October a tremendous expansion in the training of aviation medical examiners at the School of Aviation Medicine, Randolph Field.[1]

The capacity of the school was increased from six medical officers graduating in four months to thirty medical officers graduating in six weeks. The combined output of the School of Aviation Medicine, and a correspondence course in aviation medicine conducted by the school, was expected to reach 100 examiners each month. After a year of active service, these men may qualify as flight surgeons. The Naval School of Aviation Medicine at Pensacola, starting in November, 1939, with new quarters and splendid equipment, has already graduated about thirty-six naval flight surgeons from a six months' course and 113 aviation medical examiners from a course lasting about two months.

The number of physicians trained in aviation medicine in the United States can be estimated roughly from the number in the Air Corps of the Army and Navy, and the number of examiners of the Civil Aeronautics Administration. There were reported[1] to be 400 medical officers on duty with the Army Air Corps one year ago, a number which was expected to increase to about 1,300

*Read at the Fifty-second Annual Meeting of the Association of American Medical Colleges, held in Richmond, Va., October 27-29, 1941.

From the Division of Industrial Hygiene, National Institute of Health, U. S. Public Health Service.

1. J. Aviation Med. 11:198 (Dec.), 1940.

during the past year. Of these, only 750 were expected to be qualified flight surgeons; the remainder were scheduled for general medical duties.

The Navy lists in the regular service 91 medical officers who are flight surgeons, 1 aviation medical examiner and 40 officers under instruction to become flight surgeons. Also, in the Naval Reserve, there are 2 flight surgeons, 125 aviation medical examiners and 20 under instruction to become examiners. The Civil Aeronautics Administration has about 900 examiners, of whom 100 have had sufficient training and experience to qualify as flight surgeons. The sum of these figures gives an approximate total of 983 qualified flight surgeons and 1,545 aviation medical examiners in the whole country. Flight surgeons and examiners with commercial air lines may increase this total somewhat, but not significantly. In round numbers, there are 2,500 specialists in aviation medicine—about 1,000 of whom are fully trained flight surgeons.

This census indicates a serious lack of qualified aviation medical officers to select and care for the large number of air men who must be trained. The Secretary of War announced last week that army air forces would be expanded by June 30, 1942, to 400,000 flying cadets and enlisted men. Obviously, many more trained and experienced flight surgeons are needed than are now available. In this emergency what contribution can American medical schools make?

We must distinguish between the immediate needs of the present emergency and the requirements of a more ideal scheme in which the training of the specialist in aviation medicine would be not less thorough and sound than that of the practitioner of orthopedic surgery, cardiology or any recognized medical specialty. It may be taken for granted, that the service schools will accelerate their training program to the limit of their capacities. Existing facilities, however, do not allow all officers in the Medical Reserve Corps who desire to do so to take even the extension course.

Very few medical schools are equipped with the special facilities necessary for training in aviation medicine, such as a decompression chamber for simulated altitude exposure and specialized test apparatus, nor do they have access to the practical training facilities of an air station with large numbers of air men daily engaged in routine flight or in learning to fly. The brief courses given by the service schools devote much time to review of the principles of the medical and biological sciences which are important in aviation medicine: physiology, especially as related to altitude, physiological optics, ophthalmology, otology, laryngology, physical diagnosis, cardiology, psychology and psychological testing methods, psychiatry, neurology and traumatic surgery.

Medical schools are well equipped to give review courses and seminars in these fields as they apply to aviation for medical graduates and fourth year medical students. Courses of this nature in the fundamentals of aviation medicine, properly integrated with the work of the service schools, can be of great value in the aviation training program. Each medical school will require a coordinator, preferably a flight surgeon of the Army or Navy with experience in teaching aviation medicine, as liaison officer to assist in organizing the course. The director of the course should endeavor to take advantage to the greatest extent

possible of the teaching resources of the institution and the community in which it is situated, particularly in planning instruction in physiology, neuropsychiatry and the functions of the special sense organs. In some universities it may be possible to add to this program flying instruction, technical lectures in aeronautics, work with special apparatus like the Link trainer, and opportunity to assist in giving examinations to applicants for flight instruction. The primary objective of the course, however, should be to provide the essential theoretical and general foundation upon which to base the final practical training of the flight surgeon.

Experience indicates that an intensive review course can be given in as little time as eight weeks. If it is intended to be given for medical students with other concurrent courses, it must, of course, be integrated with the work of one or both of the final terms before graduation. I shall not attempt to suggest in detail the curriculum of such a course. The extension course of the School of Aviation Medicine[2] is an excellent model, and is based on the most extensive teaching experience in aviation medicine. The course is organized in the following way:

EXTENSION COURSE OF THE SCHOOL OF AVIATION MEDICINE

Subcourse 1.—Ophthalmology and Otology: A review of the anatomy, physiology and histology of the eye and its adnexa; the etiology, symptomatology and diagnosis of common ocular affection; physiologic optics; the objective and subjective examination of the eye as pertains to the standards required for flying, including refraction, disturbances of motility and ophthalmoscopy. Etiology, symptomatology and diagnosis of common affections of the ear, nose and throat; the physiology of and the functional examination of the inner ear.

Subcourse 2.—Aviation Medicine:

Section 1.—Cardiology.—Embryology, anatomy, histology, pathology and physiology of the heart; methods of cardiovascular examination; etiology of heart disease; cardiac failure; enlargement of the heart; valvular diseases; rate and rhythm, including electrocardiography; infection in heart disease; vascular diseases; x-ray methods; neurocirculatory asthenia; the Schneider index rating; general physical examination, including lungs, bones and joints, genito-urinary system, teeth, etc.

Section 2.—Physiology.—Physiological aspects of aviation, other than altitude, including spatial orientation, sensitiveness to motion, effect of speed, centrifugal force, cold, wind and light; physiological effects of altitude changes, including barometric pressure, oxygen demand and transfer, respiration and hematorespiratory function of the blood; types of anoxia, methods of production, symptoms and compensations; physiology and hygiene of muscular exercises; physical fitness; fatigue.

Section 3.—Administration.—Air Corps organization, including functions and subdivisions of heavier-than-air and lighter-than-air aviation; aviation accidents; machine-shop accidental airplane dope poisoning; motor and airplane ambulances; protective devices, including oxygen supply apparatus; equipment of the flight surgeon; duties of the flight surgeon; general provisions of Army

2. Announcement of Army Extension Courses, 1938, Government Printing Office. Outlines, Notes and Instruction Manuals of the School of Aviation Medicine, Randolph Field, Texas.

Regulations relating to flying and the examination for flying; flight surgeon's records.

Subcourse 3.—Psychology.—

The methods and subject matter of psychology; the connecting and receiving mechanisms; origin, development, general characteristics and inventory of instinctive activities; psychological types; psychology with reference to the aviator, including the essentials of memory, attention, perception, emotions, personality, etc., the learning process, psychometric measurements; performance tests, word association tests; foreign tests and research; personality study.

Subcourse 4.—Neuropsychiatry.—

Section 1.—Psychoneuroses.—Descriptive and genetic psychology; abnormal psychology; nature, causes, and classification of the mental disorders; general symptomatology; borderline states comprising psychopathic personalities and the minor psychoses; methods of examination; neurological examination for flying.

Section 2.—Psychoses.—Schizophrenia; manic-depressive psychoses; general paralyses; paranoia or paranoid conditions; psychosis with cerebral syphilis; psychoses associated with organic diseases or an injury to the brain; symptomatic infection, exhaustion, and toxic psychoses; presenile, senile, and arteriosclerotic psychoses and mental deficiency.

The course which has been outlined above is primarily designed for graduates in medicine who have completed an internship. Medical students ordinarily do not have sufficient clinical experience to qualify for the final practical training which should follow as soon as possible after the review course.

Leaving aside the present emergency, it is a more difficult task to define the place of aviation medicine in the medical school curriculum. What are the duties of the flight surgeon, and what is the relationship between aviation medicine and other medical disciplines? The duties of the flight surgeon are: (1) the selection of pilots and other aircraft personnel for fitness to fly; (2) protection of the lives and maintenance of the health of pilots and all others who fly; (3) research in problems of aviation medicine, and (4) tests of apparatus and equipment designed to protect the pilot from the effects of his occupation and environment. The education of flight surgeons aims to supply trained specialists for (1) military services, (2) nonmilitary governmental and civilian commercial agencies, and (3) research.

Although attention is focused today mainly on the military aspects of aviation medicine, it should be realized that aviation medicine is actually a branch of preventive medicine of continuously increasing importance in public health. Specifically it belongs in the field of industrial medicine, with which it shares many problems, principles and technical methods.

The foremost problems of aviation medicine today are:

(1) Selection of personnel for fitness to fly and for specific duties in flying.

(2) Anoxia—protection of air men from the effects of low oxygen pressure through training and special equipment.

(3) Decompression sickness—protection from the mechanical effects of reduced atmospheric pressure, especially air embolism.

(4) Fatigue—protection from other factors in the environment of the flyer which produce discomfort and stress, including noise, extreme temperatures, and the inherent strain of a hazardous occupation.

(5) Acceleration—protection against the effects of high acceleration and centrifugal force, almost entirely a problem of military aviation.

The selection of personnel is a familiar problem in industrial medicine. The technique of the pre-employment examination is used widely in industry in order to select workers according to aptitude and physique, and to screen from certain jobs those men known from test or experience to be specifically susceptible to the health hazards of these jobs, e.g., in the case of individuals known to be sensitive to allergy producing materials or physical agents. This parallel between personnel selection in aviation medicine and industrial medicine extends throughout both fields. Trained air men, who have proved their ability to fly, must be tested further and selected for resistance to the effects of acceleration, air embolism and fatigue.[3]

There is no need to continue with this analogy, but there is one aspect of this common field which is instructive from the point of view of medical education. Pre-employment examinations or flight physical examinations on large numbers of candidates require accumulation of many items of medical data, and statistical treatment of the results. Necessarily, many physicians of diverse types and degrees of training and experience are employed in these examinations. The reliability of these examinations always comes under consideration when these results are analyzed critically, particularly when data are available from repeated examinations of the same individuals by different physicians. This is particularly true in the case of examinations of commercial pilots for licenses where the job of the applicant as well as his health and safety may be at stake. Mr. Donald H. Connolly, Administrator of the Civil Aeronautics Administration, wrote a letter to Dr. L. H. Bauer, Chairman of the Liaison Committee of the Aero Medical Association, which was read and discussed at the annual meeting of the Association last October. Mr. Connolly stated, in part, in this letter:—"We have been making a careful study of our records and though the complete results are not yet available, we have found some very surprising data. We find that the reliability of the medical examination is extremely low and hope we can find some way to increase this reliability . . ."

Dr. Raymond Franzen and Dr. Dean Brimhall[4] of the Civil Aeronautics Administration have made a study of data derived from medical examinations of pilots for licensure by the Civil Aeronautics Administration. The statistical analysis is too complex to present in detail here, but the following summary will indicate the nature of the findings. Figures are given for visual, structural, color vision, hearing, cardiovascular and psychiatric disability cases examined by more

3. Jones, B. F.: Recent Progress in Aviation Medicine. M. Clin. N. Am. (in press).
4. Franzen, R. and Brimhall, D.: Problems of Consistency Arising from the Civil Aeronautics Administration Medical Examinations. Civil Aeronautics Administration Report. (in press). 1942.

than one physician where the defect was noted by one physician, all physicians, or more than one but not all physicians. Data are given for total cases examined and for cases disqualified because of the defect noted. The scores of examining physicians range from best in the case of the visual disability cases to poorest in the case of psychiatric disability. For example, 3,703 men were examined by 2 physicians for visual defects, including visual acuity, visual acuity corrected, visual acuity partially corrected, depth perception, and muscle imbalance. Fifty-three per cent of defects were noted by both physicians, 47 per cent by only one; of 198 disqualified men, 73 per cent were noted by both examiners, 27 per cent by only one. With three examiners and 1,153 total cases, the proportion noted by all examiners was 38 per cent, by two examiners, 21 per cent and by one examiner alone, 41 per cent; with three examiners and 103 disqualified cases, the proportions were 78 per cent by all examiners, 10 per cent by two examiners and 12 per cent by only one examiner. In 58 total cases of psychiatric disability examined by two physicians, only 9 per cent were noted by both examiners, 91 per cent by only one; of 19 disqualified cases, 95 per cent were noted by one physician only. With three examiners, of 23 total cases, 91 per cent were noted by one examiner alone and 90 per cent of ten disqualified cases were noted by only one of three examiners. These findings apparently cannot be explained by changes in the pilots between examinations.

It was probably no accident that the reliability of the visual examination was highest, while that of the psychiatric examination was poorest, since the former employs chiefly objective methods and the latter chiefly subjective means. In this connection, it is interesting to note that visual defects exceed all others as a cause of rejection of candidates for flying training in the Army, and candidates for licensing by the Civil Aeronautics Administration.

According to Grow and Armstrong[5] the principal causes of rejection of 100 candidates for flying training in the Army Air Corps were as follows: in the eye examination, 62 rejected; in the ear, nose and throat examination, 8 rejected; in the general physical examination, 15 rejected; and in the neuropsychic examination (including the personality study), 15 rejected. This is astonishing, considering the age of these applicants, and probably reflects the greater ease and certainty with which visual defects can be established.

I think the conclusion to be drawn from the foregoing is that the new field of aviation medicine is vastly more complex and difficult than at first appeared. More objective methods of diagnosis and classification are needed; standardization of the use of existing methods is also indicated. These things will come from research and more thorough fundamental and specialized training.

The assessment of physical fitness has long been recognized as one of the most difficult tasks with which military and industrial medicine are preoccupied. In this connection, it is worth noting that leading specialists in aviation medicine are well aware of the necessity, on the one hand, for improving the training of physicians in this field and, on the other hand, for making available improved methods of diagnosis and classification. In discussing standards for physical

5. Grow, M. C. and Armstrong, H. G.: Fit to Fly. New York: D. Appleton-Century Co. 1941.

examinations of fliers before the Aero Medical Association, Dr. Bauer[6] stated that the American College of Physicians recognizes aviation medicine as a subspecialty of internal medicine. Thereafter, at the same meeting, a motion was passed by the Association to appoint a committee to investigate the possibility of establishing standards for aviation medicine as a subspecialty of internal medicine, and the establishment of a national examining board in aviation medicine.

Investigation of technical methods for selection and classification of fliers is also being vigorously carried on in many laboratories. Almost every technical method at hand, physiological, psychological and clinical, has been investigated for its usefulness in predicting the flying ability or assaying the physical fitness of flying personnel.[7]

Rapid advance in aircraft design and performance continually places air men, particularly in military aviation, under novel and increased stresses for which research must seek a remedy. In this discussion I have emphasized pilot selection and related problems, because we may expect that eventually engineering advances will solve most of the pressing problems of aviation medicine, anoxia, air embolism, exposure to cold, etc., but the problems of pilot selection and accident prevention will certainly persist.

In pursuit of the parallel between aviation medicine and industrial medicine, it should be noted that prevention of anoxia by protective respiratory apparatus, fatigue, air embolism (in caisson workers, e.g.) and exposure to extremes of temperature are all problems of importance in industrial medicine, as well as in aviation medicine. Two other common characteristics of these fields are worthy of mention at this point. A vital part of the duty of both the flight surgeon and the industrial physician is the education of the men under their care to understand and respect the hazards of their occupation, and to realize the need for maintaining physical fitness. The other outstanding common attribute of the two fields is the tremendous territory which each covers. This necessitates the use of many highly specialized techniques, and inevitably means the employment of groups of technical specialists in the solution of problems—physicians, engineers, chemists, physicists, physiologists, psychologists, pathologists, ophthalmologists and many others. And unless the industrial or aviation physician has been adequately trained in the fundamental fields of his specialty, the capital position which he now enjoys as coordinator of the group will inevitably pass to one of the non-medically trained specialists.

Henderson's English translation of the Medical Guide for Flying Personnel, published in 1939 by H. von Diringshofen of the German Air Force contains some interesting remarks which illustrate the German experience in regard to the training of physicians attached to the air force:

"This foundation for the medical guidance of the fliers has not yet been laid everywhere, although its value for the decrease of flying accidents has been proved by flying statistics throughout the world since the last war. The reasons why it has not been established are various. Partly it is due to the fact that the medical officer is not a

6. J. Aviation Med. 12:104 (Mar.), 1941.
7. Jones, B. F.: Recent Progress in Aviation Medicine. M. Clin. N. Am. (in press).

qualified pilot and is not even able, as an "observer" would be, to judge properly the bodily and mental exertions of flying personnel. Also as yet, owing to a shortage of medical officers, only some of them have been put through the courses which enable them to understand the important physical and physiological problems of high flying. Those who are now entering are fortunate in having had a proper training.

This lack of proper instruction, which is now being filled, together with the general deficiency of the young physician in experience of life, has frequently led to his neglecting the particularly important duty of watching over the flying efficiency of the personnel under his care by thinking about their mental and nervous state. This is particularly true since during his university training the study of psychology and of the character of persons has usually been very largely neglected. And because of this lack it is easily understood that for the judgment of character, non-medically trained psychologists have had to be drawn upon. It is, however, clear that owing to the close relationship between bodily and mental states, the physician trained in psychology and in aviation medicine should have a marked superiority to the psychologist.

If the physician attached to the flying service has not been properly trained for his duties in the air force and has not acquired a knowledge of his particular duty, he is apt to underestimate this most important side of his medical work. And such a physician will soon find that his work is confined merely to the care of the sick, general sanitary problems, and preparation for the care of accidents."

CONCLUSIONS

In conclusion, I do not wish to advocate any rigid formula for the teaching of aviation medicine to medical students. To meet the needs of the emergency condensed courses are recommended for graduates, possibly for fourth-year students. The content of these courses would be chiefly review of principles of medical sciences on which aviation medicine is based. Instruction in aviation medicine for those who plan a career in this field is essentially a program for graduates. In my opinion medical schools would not be justified in giving a comprehensive course in aviation medicine to medical students. In normal times only a small proportion of medical students would be planning to enter aviation medicine as a career after graduation. And the exigencies of the medical school curriculum hardly allow time for the introduction of an extensive course in this field.

There are two essential factors in the teaching of aviation medicine to medical students: The first is sound and thorough instruction in the basic medical subjects, above all physiology, and the second is internal organization of medical school courses and coordination of courses in order to present the elementary principles of aviation medicine in a complete and orderly fashion. To these may be added a short course of lectures, to be given as a part of the (fourth year) course in preventive medicine, or independently. The objective of this course would be not so much to increase the technical knowledge of the student as to stimulate interest in the problems of aviation medicine, and to integrate the pertinent information he has already acquired in the field.

There is no special field in medicine which makes greater demands on the physician's theoretical and practical training in the physical and biological sciences than aviation medicine does. For this reason, satisfaction of the minimum entrance requirements of most of our medical schools in chemistry, physics, mathematics, psychology and other biological sciences does not give an adequate

foundation for eventual specialization in aviation medicine, or any other branch of industrial medicine.

Little modification of the existing medical curriculum is required to attain the objectives I have outlined. The particular system employed will necessarily vary from one school to another, and should be planned by a member of the faculty who will act as coordinator. The outstanding features of such a scheme would include:

I. FOR THE FIRST YEAR

(a) *Physiology and biochemistry:* Organization of the regular work to illustrate applications of physiological principles and technique to the study of environmental agents. Lectures and demonstrations on the effects of acute and chronic exposure to low oxygen pressure and altitude acclimatization; circulatory effects of anoxia and acceleration; physiological optics; technique and theory of the administration of oxygen; fatigue and the physiology of muscular exercise; assessment of physical fitness.

(b) *Psychology:* Review of the essentials of psychology. Lectures and demonstrations on psychometric tests, including psychomotor testing. The psychological basis of personnel selection.

II. FOR THE SECOND YEAR.

(a) *Pathology and surgery:* A short course in experimental pathology of physical agents. Lectures, reading and laboratory work on shock, and the effects of heat, cold, air embolism and toxic agents.

(b) *Physical diagnosis:* Special attention to the use of objective aids such as the electrocardiogram.

III. FOR THE THIRD YEAR.

Ophthalmology and otology: At least one lecture with demonstrations on the methods of examination of the eye with reference to visual standards in aviation, including refraction, tests of function of the eye muscles, color vision and others. A similar lecture and demonstration on the ear with reference to defects disqualifying for flight training, and the influence of noise and pressure changes on the ear.

IV. FOR THE FOURTH YEAR.

(a) A course in *biometrics,* with special reference to the analysis of medical and psycho-physiological data of problems of personnel classification and selection.

(b) A *final review course* to integrate the work of the entire four years.

Finally, the surest method to arouse interest in aviation medicine among students and faculty and insure learning of the basic principles of aviation physiology is to encourage research. In any institution the director of the research program is the logical choice for coordinator of the entire teaching program in aviation medicine.

The Teaching of Pathology*

F. L. Apperly
Professor of Pathology, Medical College of Virginia
Richmond, Virginia

INTRODUCTION

My subject today, the teaching of pathology, has been discussed at these meetings on several previous occasions, but the discussions have been concerned almost entirely with the technics of teaching. I also will have something to say about these technics, but it will merely be by way of illustrating my main theme, namely, the creation in the student, of a point of view, or attitude, toward disease: a thorough grounding in the biological principles underlying disease, and, perhaps, some judgment and wisdom in the application of these principles.

Perhaps, I could begin by relating some of my personal experience, which I feel sure will find an echo in the memory of many of you. In my young days, the study of pathology was limited almost solely to morbid anatomy, gross and microscopic. How these changes were brought about, what they really meant, how they produced altered behavior (symptoms) and the inner significance of symptoms we were not told. For all we knew, these diseases might have been dealt out to human beings as punishments by an angry God, or have originated in sheer cussedness. When, in my junior and senior years, I entered the wards and the outpatient department, I found that my pathological knowledge was of little use, since it had no explanation for what the patients complained of. It is true, that I knew something about gliomas and chronic nephritis, for instance, but my knowledge did not explain why patients with these diseases complained of headaches or vomiting. Still later, I taught clinical medicine in a university hospital for six years. In each new case, we discussed the diagnosis, the probable morbid anatomical changes, and the treatment, but just as often some student would ask, "But why did the patient vomit, or have headaches, etc?" I did not know. My colleagues did not know. And so it appeared that diagnosis consisted in learning by heart a string of symptoms, usually not applicable until the patient had reached the textbook stage, only a step short of the autopsy stage. Clearly, this was a most unsatisfactory condition of affairs. It was then that I became seriously interested in the processes of disease, which led me back to physiology, biochemistry and pathology.

The reason for all this was that our pathologists were primarily hospital pathologists, interested in morbid anatomy only; they had had little or no training in physiology, biochemistry and clinical medicine. Although they realized that they dealt with end results, they had little idea how these end results were brought about.

It is little wonder, therefore, that we found morbid anatomy dry, dull and of little use to us in medical practice. Even today, it is difficult to interest the older practitioners in morbid anatomy demonstrations.

*Read at the Fifty-second Annual Meeting of the Association of American Medical Colleges, held in Richmond, Va., October 27-29, 1941.

The pathologists of those days were not, of course, to blame, since pathological knowledge had hardly extended far beyond the confines of morbid anatomy. But nowadays there is no excuse for allowing the man who is only a morbid anatomist to teach pathology to medical students.

More recently, and especially in the English schools, there entered the field of pathology a number of men who had been well trained in physiology and medicine—men like Boycott in earlier days, and Howard Florey in later days—men who realized that the study of structure without function is meaningless, that the study of disease includes the living reaction of the whole man to his noxious environment, and, hence, that the study of pathology includes the whole story, or series of events, from the beginning to the end. Pathological physiology, or function, and pathological biochemistry are an integral part of pathology and cannot be divorced from it.

To illustrate this interrelation, I offer the following:

The study of pathology includes:

1. Nature of the injurious agent; physical or chemical; living (Bacteriology: Parasitology).
2. Passive changes in affected tissues; degeneration, necroses, injuries; hypofunction.
3. Reactive changes
   (a) locally—inflammation and repair
   (b) general—hyper-function of other (healthy or less affected) organs or tissues, in an effort to re-establish equilibrium (Pathological Physiology).
   (c) psychic—mental reaction of the patient's personality to his illness and its accompanying problems (Morbid Psychology).

I regard a thorough understanding of these relationships as essential for the student, in order that he may have a clear idea of the significance of symptoms—i.e., the altered behavior of an individual endeavoring to readjust his whole mechanism to altered environment. When this is understood, the inestimable value of symptom interpretation will be realized, and the ruthless dictatorship of gadgets broken and relegated to its proper place.

With this introduction we can now summarize, first, what the students want to know and, second, what the teacher ought to know.

WHAT THE STUDENT WANTS TO KNOW

Briefly, the aim of our medical schools is to train "the basic doctor" (a) to look after the sick intelligently and effectively and (b) to forestall illness. This is only possible if he knows the whole series of events in disease—first, the physiological disturbances with altered behavior, and, later, the anatomical changes—that finally lead to its natural termination. Only if equipped with this knowledge can he hope to break the chain of events at one of its links. We are not concerned with training our students to be pathologists who will spend their lives pinning names on unknown pieces of tissue removed at operation and

autopsy—handmaidens to the clinician. That may come later, if the "basic doctor" wants to enter that specialty, but that is not our present concern. If we do our job properly, the student will then be in a position to learn, on the wards and in the outpatient department, the arts of recognizing and of treating disease, which is clinical medicine. The principles underlying the arts of diagnosis and treatment should become clear during his study of pathology, since diagnosis depends so much on the interpretation of altered behavior, and treatment ideally consists in the restoration of biological equilibrium.

Under this heading we might also mention a matter of considerable importance to humanity, the nation and the medical profession, in the near future of a chaotic world, and that is the question of future leadership in medicine—statesmanship in our councils and leadership among men of research, the makers of medicine. It is true, of course, that scholarship is not leadership, but real leaders will be sought or will arise from the ranks of scholarship. The qualities of leadership and scholarship cannot, perhaps, be created, but I do feel that a system of teaching that holds back the brilliant man of ideas, intellectual curiosity, industry and independence of thought, to the pace of the class as a whole—this system, I believe, is wrong. This small group in every class should have the best and most stimulating teaching, as much personal contact and supervision as we can give them, more problems, as fast a pace as they can bear, and a more free and flexible schedule. I am fully aware of the difficulties of an overworked teaching staff and I offer no solution, but I do want to present this problem to you for thought and, perhaps, future action.

THE REQUIREMENTS OF THE TEACHER

Obviously, from what has been said, the teacher of pathology must be something more than a morbid anatomist. It is probably safe to say that the average good hospital pathologist is not well equipped to teach the science of disease in the way I have described. To do this, he must have had more than the usual training in physiology and biochemistry. He should have had a good clinical experience and, indeed, should still be a frequent visitor to the wards to see and examine patients with the clinician. Only thus can he retain a lively appreciation of the student's requirements and keep his mind open, alive and receptive for new ideas and the tackling of problems of research. These desirable ends are more readily attained in those medical schools where the departments of pathology, physiology, biochemistry and anatomy are in close collaboration and physical proximity, working together hand in hand, and not separated by water tight compartments.

OUR OWN METHODS OF TEACHING

Although the subject matter taught in our department probably differs a good deal from that taught in many other departments, our methods probably differ very little. We proceed on the theory that our methods must, in some way, provide opportunity for the application of the students' knowledge to the problems of practical medicine. Any system that does not do this is badly planned

and incomplete. Contrary to some advanced educationalists, we have retained the lecture, not, however, for bald descriptions of lesions (as in my student days) but rather for a discussion of the series of events that make up a certain disease, and the coordination of the various demonstrations of museum or fresh specimens, microscopic sections and other exhibits that are to follow. Since, however, Providence seldom provides the appropriate autopsy for demonstration after each lecture, we have to fall back on our museum specimens, mounted and unmounted, and on a large collection of lantern and microscopic slides. These are accompanied by complete autopsy and clinical records. By this means we can trace and discuss, in small groups, the history of the patient's illness, the origin and significance of his symptoms and signs, together with a few words on the principles on which treatment depends. This plan is supplemented by appropriate demonstrations of experimental pathology in animals and, later in the year, by the study of complete autopsy cases, in which all the organs have been preserved.

From my experience here and in several British countries I feel that we here are inclined to over-emphasize the teaching of microscopic pathology and under-emphasize the teaching of gross pathology. This has probably arisen from the fact that in contrast with British and Dominion medical schools, autopsies are difficult to obtain, and hence American schools have leaned more toward microscopic slides as teaching material. In Britain, Ireland and Australia, non-paying patients are admitted to hospital only on condition that, in case of death, the hospital has the right to make an autopsy, if desired, although in rare cases of objections the right is usually waived. All autopsies are then held at a fixed hour each day, attended by the interested clinicians, senior and junior students, and the period becomes a combined clinicopathological conference and autopsy. Several cases may thus be dealt with at each session. Specimens are labeled and handed around the class. When the student graduates he has usually seen between 400 and 600 autopsies, together with the clinical and pathological discussions. The establishment of these conditions in our schools, so contrary to public custom, and of such tremendous teaching value, must remain, I fear, a pious wish without much hope of fulfilment. The result, however, is that I have met students who have never seen an autopsy in their lives and middle-aged practitioners who have never seen a specimen of, say, endocarditis and had no idea what it looked like.

These conditions force us to a more extensive use of the museum. We have been largely guided by Boyd's work in Winnipeg and Toronto, and by the Wellcome Museum in London, in the creation of our museum, with its specimens, diagrams, pictures, photographs, X-rays, electrocardiograms, temperature and statistical charts, blood films, historical pictures, and other exhibits that convert our museum into a library of pathological information. We limit our teaching museum to 1,500 specimens, all of common diseases, except a few rare specimens that illustrate important physiological principles. Rarities and curiosities are stored away in another place. Our museum is open until 10 o'clock every night under the eye of a student-curator and provided with comfortable seats that encourage the student to use the museum as a place of study, not only for the

use of sophomores, but for juniors and seniors as well. There are also many large receptacles filled with unmounted specimens, together with diagnosis cards, for students to play with at will. The latter have proved to be quite popular. We have encouraged the study of gross pathology since it would seem obvious that such knowledge is of much more use to the basic doctor—perhaps operating in a country district, without a pathologist at his elbow—than a head full of microscopic details. In fact, our students study microscopic pathology, not as an end in itself, or as a training in microscopic diagnosis, but solely as an aid to understanding the phenomena of disease.

In conclusion, we realize that the good doctor requires not only technical knowledge together with ability and judgment, but also a knowledge of men and of affairs, an interest in humanity and wide learning, for these are essential to continued intellectual growth. In this paper however we are concerned only with a part of his technical training, but, we hope, taught in such a way as will give him experience and increase his judgment and wisdom, rather than filling him with a multitude of dry and sometimes indigestible facts.

DISCUSSION

DR. VIRGIL H. MOON (Jefferson Medical College): I have listened to Dr. Apperly's presentation of his conception of the scope of pathology and the methods for presenting it, with keen interest and with hearty approval. Both are distinctly different from those of many pathologists. It seems remarkable that two men of distinctly different nativity, environment, education and experience, should have arrived at so nearly identical conclusions as have Dr. Apperly and myself.

The students in the Medical College of Virginia are particularly fortunate to have pathology presented to them by the methods described. I venture to assert that very few of the physicians present here today received their instruction in pathology in anything like this fashion. Pathology as taught in most medical institutions consists of detailed descriptions of the gross and the microscopic changes seen in organs and tissues incident to disease. In other words, pathology is presented as descriptive morphology.

It is not difficult to understand how this conception originated. It is traceable directly to Virchow's magnificent contributions on morphology which gave pathology a place of importance among the basic medical sciences. He and his followers studied and recorded the morphologic features of the known diseases and taught the medical profession to think of disease in terms of anatomic diagnoses. Virchow's influence determined the measures which subsequent generations have used in presenting pathology to physicians and to students of medicine.

It was my privilege to have a rather close personal acquaintance with Professor Ludwig Aschoff who was one of the eminent pathologists of his generation, not only of Europe but of the world. I have heard him express a degree almost of resentment on being called a pathologist, or in being asked to explain something of the functional disturbances in the condition which he was describing accurately. He disclaimed knowledge of that phase of the subject and insisted that he was a morphologist.

Unfortunately, the morphologists were so engrossed in their fascinating explorations that they gave little attention to etiology and less to pathological physiology or disordered function. I can testify from personal experience, both as a student and as a teacher, that pathology taught in this detached fashion is dull, difficult and utterly uninspiring. Every teacher should give thoughtful consideration to the purpose of his instruction. If the

purpose of instruction in pathology is to train morphologists, then the type of instruction to which we have referred is perfectly in order; but if the purpose of that instruction is something different, then the mode of presentation should differ accordingly.

It is my well considered opinion that the purpose of medical teaching in most medical schools is not to train specialists but to train practitioners of medicine in one or another of the clinical fields; that, perhaps, only one per cent, or certainly a very small percentage of those who graduate from medical schools become pathologists. Why, then, should the training be shaped with reference to that specialty rather than for the broader purpose of preparing medical students to understand the principles of clinical medicine, beginning with etiology and ending with symptomatology, as my colleague so forcefully suggested?

Medical educators long have deplored the presence of a gap between the basic medical sciences and the clinical subjects of the curriculum, and they have discussed means for bridging that gap. I have the firm conviction that deficiencies in the teaching of pathology are responsible in large measure for the hiatus mentioned. At a previous meeting of this Association, the following statement was made by a speaker who was not himself a pathologist: "The quality of the teaching in a medical college cannot rise higher than its teaching in pathology."

Some pathologists in this country have adopted a broader view of the purpose and scope of the subject of the medical curriculum. For example, a pathologist now is not content with minutely accurate descriptions of the lesions of tuberculosis and with the fact that they are caused by tubercle bacilli. His curiosity goes beyond morphology and leads him to inquire into mechanisms. He inquires how the bacilli produce the lesions, why the lesions vary under differing conditions, and how they are related to disturbances of function. His inquiry probes into the mechanism of each feature and manifestation. He emphasizes the relationship between functional disturbance and symptomatology. This should be the scope of the pathologist's interest in each and every form of disease, whether infectious, metabolic or neoplastic.

Pathology has evolved into the status of a science, a medical science, and it can no longer be defined in terms of morphology; it can be more properly defined as the science of disease. A presentation of pathology in this sense will include a consideration of pathogenic or etiologic agents appropriately classified, a discussion of the mechanisms of their actions, a description of the morphologic changes, perhaps with emphasis on the gross changes as Professor Apperly suggested, perhaps with emphasis on the microscopic changes. I feel that it would not be advantageous to emphasize either of these phases to the exclusion of the other. And it should include deductions concerning the resulting disturbances of function.

When pathology is taught in this fashion, no gap exists between the preclinical sciences and the clinical studies of disease. There is a logical progression from normal anatomy, histology and physiology, through pathogenic agents and their effects, to the morphologic features of diseased tissues, and through disturbed function to the symptomatology and manifestations which underlie clinical medicine. Pathology so taught integrates perfectly with other subjects in the medical curriculum and is essential to a comprehension of disease and its manifestations.

When the late William Osler said, "As is our pathology so is our practice," I apprehend that he was not referring to the morphologic features of pathology, but rather was using the term in its broadest connotation as the science of disease and as embracing the principles which Professor Apperly has so ably presented.

When pathologists are more concerned with mechanisms than with morphology; they have no need to magnify the importance of the subject to medical students. The latter find the subject easy, logical and intensely interesting when it integrates, on the one hand, with etiologic mechanisms and, on the other, with resulting dysfunctions. The

latter, in the final analysis, constitute symptomatology. The student who grasps these relationships has laid a well buttressed foundation on which to erect the superstructure of clinical medicine.

Dr. Wiley Forbus (Duke University School of Medicine): It always amazes me that it is necessary before a body of this sort for a group of pathologists to have to make speeches, such as Dr. Apperly and Dr. Moon have made this morning. It is necessary, obviously, that such speeches have to be made, but I think that if one will just look back in Garrison's History of Medicine, or if he is a little bit more inclined to be historically minded, if he will look back a little bit, he will find out that everything which has been said here this morning has been said over and over again by those very people who were responsible for the creation of the science of pathology—if there is a science of pathology.

Virchow has been referred to this morning by Dr. Moon in a certain connection, and Dr. Moon has emphasized what I think everybody attributes to Virchow, and that is, a state of mind which made it possible for him to conceive of disease only in terms of morphology. Now, that that was not correct, or that that conception of what Virchow taught is not correct, can be found out in two minutes by reading the first article in the first issue of Virchow's Archiv. You do not even have to do that. If you will go into the library and pick up the current number of Virchow's Archiv, you will find that the title of that journal tells you what Virchow thought about pathology, and that is that it is a complete science. It is what Dr. Apperly has so carefully put before you this morning, and which Dr. Moon has emphasized.

The second point I would like to make is, perhaps, to do nothing more than to say, "me too" for what my colleagues have said already. In a certain connection I have been attempting during the past three or four years to bring before our own teachers the things you heard this morning, that is, a broad conception of the nature of what pathology is and what it is struggling to do.

I think I can summarize what my own conception is of the relationship of structure to function in pathological teaching, in just one sentence: Physiology is an expression of a biological process. Physiology is a presentation of a biological process which we can perceive with our ordinary senses and with certain specialized techniques. Anatomy is the record of that biological process. It is perfectly obvious that biological processes require time for their development and that it is unlikely that we shall be able to see or observe or measure those biological processes that are in their most delicate phases of development. Therefore, if we would know something about those biological processes of the earliest phases, we must know something about what goes on in the cells which are responsible for those processes.

My point is this: It is impossible to divorce any one of these things from the other, and any attempts to do that are bound to result in an inadequate conception of the nature of disease.

Interest Patterns and Achievement in Medical School*

CARLYLE F. JACOBSEN

Professor of Medical Psychology
Washington University School of Medicine
St. Louis, Missouri

In his presidential address, Dean Poynter emphasized with justifiable pride that the medical colleges had pioneered in the extensive use of aptitude testing for judging the qualifications of prospective students. Administrative officers and members of admissions committees appreciate and utilize this information but they also recognize that the medical aptitude test gives only a partial evaluation. This is not said in criticism of the test, for we should recognize that the medical aptitude test is a measure of training and intellectual capacity, and that it is not designed to measure other aspects of personality.

At Washington University, we have tried various means of evaluating other personality factors in the hope of finding techniques which will give reliable and objective data comparable to those given by the medical aptitude test. I would like to report today our experience with the Strong Vocational Interest Test.[1] This test consists of about 400 items covering a variety of occupations, school subjects, amusements, characteristics of people, and the individual's evaluation and appraisal of himself as an adult personality. When taking this test the subject responds by indicating his liking, disliking or being indifferent to these several hundred selected items. In using this test we do not act on the assumption that when a person says he likes or dislikes a certain item, that he is necessarily giving a factually correct evaluation. For example, when a student says he can accept just criticism, we do not know that he actually can do so. However, we do get an expression of his attitude on this topic. To illustrate further—why is it that the salesman feels called on to picture himself as a paragon of virtue, and the doctor, on the other hand, feels more free to admit reservation about his own abilities and attitudes?

The Strong Vocational Interest Test has been standardized for about forty different occupations and professions. The procedure has been to determine empirically the interests and attitudes that characterize the members of a given professional group—be they chemists, physicians, artists, lawyers, or bankers. The rating which a person taking the test receives is an expression of the degree of overlapping between his expressed interests and the interests which were found to characterize some particular professional group. In the data to be presented, the rating of A indicates a degree of interest comparable to that of approximately

*Read at the Fifty-second Annual Meeting of the Association of American Medical Colleges, held in Richmond, Va., October 27-29, 1941.

1. The Strong Vocational Interest Test may be obtained from the Stanford University Press, or from the Psychological Corporation, New York. A guide to the use of these tests describes, in detail, the standardization, administration, and interpretation of results. The intelligence test referred to later, the I.E.R. Intelligence Scale, is published by Teachers College, Columbia University, and is described by Thorndike in "The Measurement of Intelligence," Bureau of Publications, Columbia University, 1927. The tests in chemistry and zoology were obtained from the Cooperative Test Service.

the highest scoring 70 per cent of men who are successfully and permanently established in that occupation. The ratings of B+ and B include approximately the next 15 and 10 per cent, respectively. On the other hand, a rating of C indicates that the individual's interests fall outside of the interest pattern expressed by that professional group.

The grouping of occupational interests is not haphazard. In table 1 some of the principal groupings as revealed by Strong's statistical analysis are summarized.

TABLE 1.—PRINCIPAL GROUPINGS

I	*Technical*	III	*Social Welfare*	VII	*Linguistic*
	Artist		Y.M.C.A. Secretary		Advertising
	Psychologist		Personnel		Lawyer
	Architect		Social Science Teacher		Author-Journalist
	Physician		School Superintendent		
	Dentist		Minister		
	Mathematician	IV	*Musician*		
	Engineer	V	*Certified Public Accountant*		
	Chemist	VI	*Business*		
II	*Miscellaneous*		Accountant		
	Farmer		Office Worker		
	Carpenter		Purchasing Agent		
	Printer		Banker		
	Math. Science Teacher		Sales Manager		
	Policeman		Real Estate		
	Forest Service		Life Insurance Salesman		

In the first group, designated as "Technical," we find the following: artist, psychologist, architect, physician, dentist. In terms of expressed interest patterns, the men in these five occupations are more nearly like one another than they are like other groups. Closely related are mathematician, engineer and chemist. These individuals are also included in the technical group. The second group, designated as "Miscellaneous," includes farmer, carpenter, printer, math-science

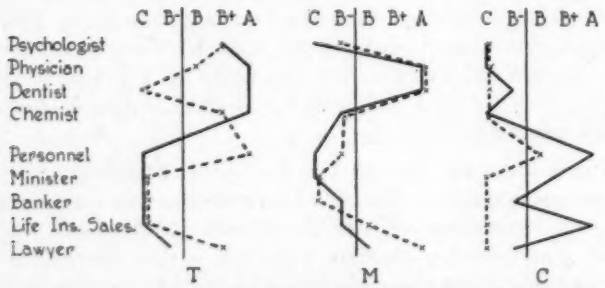

FIG. 1.—Typical variations in interest patterns among six medical students using selected professions of the Strong Vocational Interest Blank. Points to the right of the vertical line indicate presence of a particular interest pattern, and to the left, the absence of interest. Group T includes students with wide technical interests; Group M students whose interests in the technical field are restricted to medicine; and Group C students who lack any technical interests.

teacher in a high school, policeman and forest service. A group concerned primarily with social welfare follows. The musician, and quite different from him, the certified public accountant are unique in their interests. The next group is concerned with business. Detail workers include the accountant, office worker,

purchasing agent and banker, while the business contact group is represented by those primarily concerned with selling. Finally, there is a group in which linguistic interest is a common factor: advertising man, lawyer and author-journalist. I would like to point out at this time a feature which is used in the subsequent analysis of student achievement. Many individuals, especially the more capable, exhibit interest patterns not merely in one major group, for example the technical, but their interests spread to other groups also: law, personnel management, ministry, or business.

In Figure 1, the interest patterns of several medical students have been charted. The letter grades for nine selected professions are shown, the points

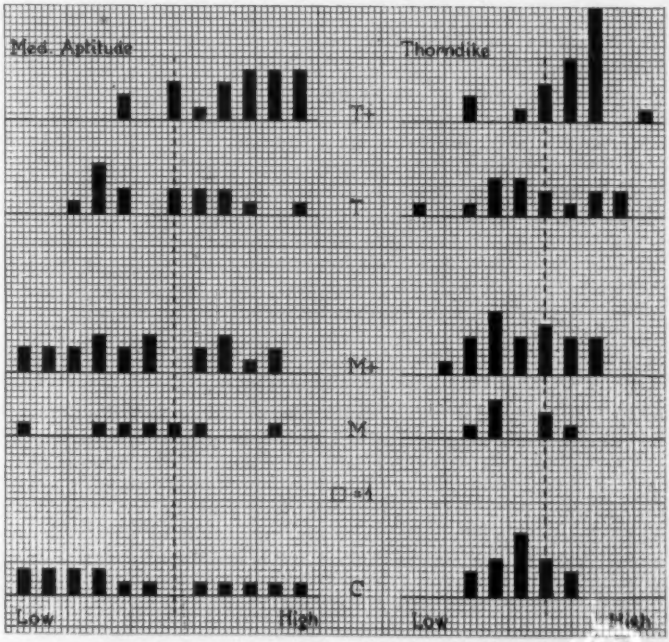

FIG. 2.—Distribution of scores according to interest patterns for the medical aptitude test and the Thorndike (CAVD) intelligence scale. The height of each bar indicates number of persons falling in each category. The higher scores are shown to the right of the median (dotted line) and lower scores to the left. T=wide technical interests; T+=wide interests plus interests in some other major interest pattern. M=technical interest confined to field of medicine; M+=restricted technical interest plus some additional interest pattern. C=lack of any technical interests.

lying to the right of the vertical line indicating the presence of a given interest pattern, and those to the left indicating a lack of such interests. For example, one individual (solid line) scores B+ as psychologist, A as physician, A as dentist, and A as chemist. On the other hand, this individual does not have significantly high ratings as personnel manager or minister, banker, life insurance salesman, or lawyer. For subsequent discussion I have referred to this individual as belonging to the T group, i.e., a person who has a technical interest pattern.

The interest pattern of a second student is indicated by the broken line. He also makes high scores in the technical group, but, in addition, he receives an A rating as personnel manager and a B+ rating as a lawyer. He has been placed in the category designated as T+, i.e., individuals having some other interests in addition to the technical. About one-third of our students make significantly high scores on the physician and dentist interest schedule, but they do not have associated technical interests in chemistry and psychology. This group has been designated as the M group. It has been similarly subdivided into those persons having some other interest in addition to medicine, M+, and those lacking interest outside the field of medicine, M. The final group, designated as C, is composed of individuals who definitely lack the technical interest pattern. They may or may not have significant interest patterns in business, law, or social welfare. The further analysis will concern these five groups. The number of students in each group is T+, 21; T—, 15; M+, 22; M—, 7; C—, 15.

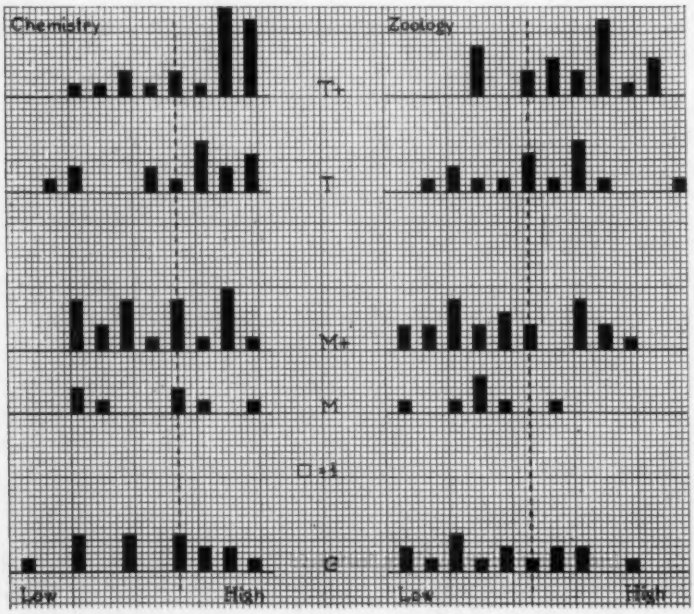

FIG. 3.—Distribution of scores according to interest patterns for the chemistry and zoology information tests. See Fig. 2 for meaning of symbols.

We may now ask concerning the characteristics of the students making up these several groups. These data are graphically summarized in figures 2 and 3. The height of each bar represents the number of individuals falling in a given category. The dotted vertical line indicates the median value for the entire first year class (1944). The high scores are indicated to the right of the median and the low scores to the left. Inspection indicates quite clearly that the performance

of the T+ group on the medical aptitude test is outstanding. This group contributed twelve of the twenty-two individuals who scored above the 85th percentile of the medical aptitude test. The performance of the T group is considerably poorer. We come now to the M+ and the M groups. We find for these groups a wider spread of ability but with only four individuals making scores above the 85th percentile. In the C group, we again find a distribution throughout the scale with a tendency for cases to accumulate at the lower levels of achievement.

In order to supplement the data of the medical aptitude test, an intelligence test and two tests of specific information in zoology and chemistry were ad-

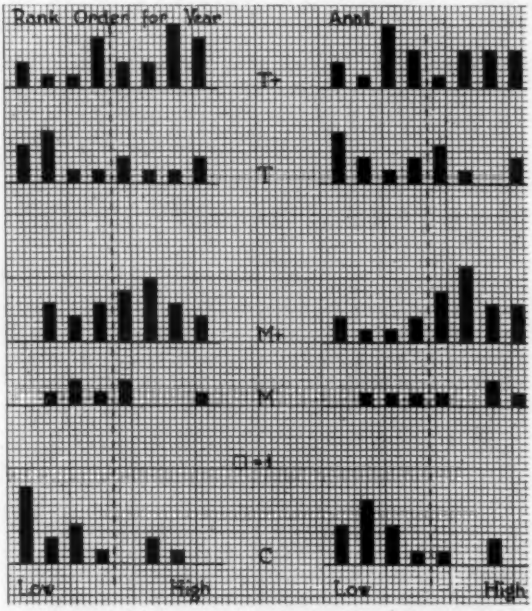

FIG. 4.—Distribution of grades according to interest patterns for all subjects of first year (Rank Order) and for anatomy. Median of class is shown by dotted line, high standing students to the right, low standing students to the left. Each column includes approximately one-eighth (ten students) of the class.

ministered. Since these tests were given without previous notice, the results are an index of the information at the students' command without opportunity for cramming.

The CAVD Intelligence Test is primarily a test of high level abstract thinking and linguistic ability, plus some emphasis on thinking in quantitative terms. It was administered to all members of the class. Again we find that the T+ group is outstanding. The T group distributes about the median of the class; the M+ and M groups slightly below the median of the class, and the C group in a similar fashion.

The results on chemistry and zoology tests are essentially similar to those found for the medical aptitude test and the Thorndike Intelligence Scale. The T+ group was outstanding. The T group has considerable information, particularly in the field of chemistry. The M+ and M groups do somewhat less well, and the C group tends to fall below the median of the class.

In characterizing these groups, we may say that the T+ group is outstanding in medical aptitude, intelligence and information in zoology and chemistry. The T group tends to do less well than the T+ group, although it is by no means an inferior group. While some individuals in the M+, M and C groups are capable of high achievement on these various tests, the groups stand below the median of the class.

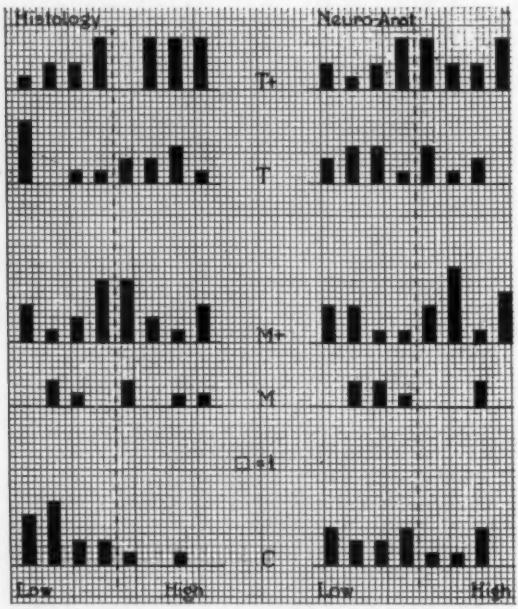

FIG. 5.—Distribution of grades in histology and neuroanatomy according to interest patterns.

Figures 4, 5 and 6 represent the progress of the several groups in the subjects of the first year (anatomy, histology, neuroanatomy, biochemistry and medical psychology). Achievement has been expressed as rank orders from (1) the highest standing individual, to (80) the lowest standing individual. Graphically, the median is shown by a dotted line with the high ranking individuals at the right and the low standing persons at the left of the median. The number of individuals falling in a given category is indicated by the height of the bar. Inspection of the graph labelled "rank order" shows a distinct tendency for the individuals in the T+ group to stand in the upper half of the class. Nine of the

first twenty positions in the class were occupied by members of this group. By contrast, the T group, i.e., those individuals who lacked interests other than technical, did distinctly less well than the T+ group, and contributed only three individuals to the top fourth of the class, although there were seven of this group among the lowest twenty individuals. The M+ group did only slightly less well than the T+ group, and, significantly, had no individual among the lowest ten students in the class. The average position of the M group is below the median of the class. Turning to the C group, i.e., individuals who lacked the technical interest pattern, we find a pronounced tendency for these individuals to score in the lowest third of the class. Five of the lowest standing ten men in the class were from the C group.

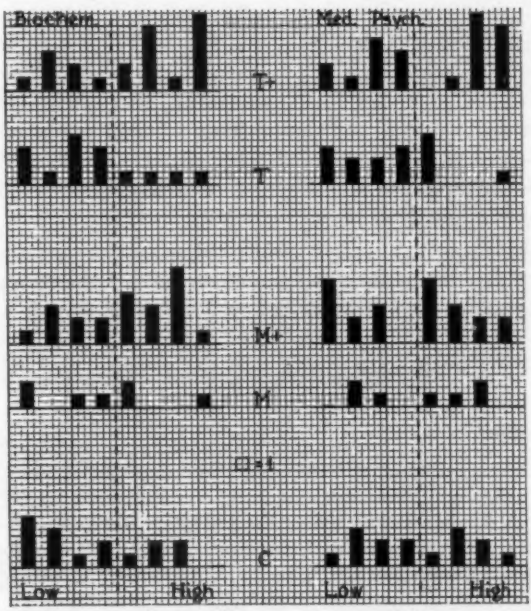

FIG. 6.—Distribution of grades in biochemistry and medical psychology according to interest patterns.

Although there are individual exceptions, the data indicate a trend for those individuals who have diverse interests to make distinctly better than average progress in the first year. On the other hand, the individuals in the T and M groups who lack such outside interest patterns do less well. The least satisfactory group is made up of students lacking any technical interests. In the interpretation of the medical aptitude test results, one point deserves particular emphasis. The M+ group did rather poorly on the medical aptitude test, yet this group achieved considerably above expectations. It suggests that the score on the medical aptitude test should be evaluated individually according to the applicant's interest pattern.

Can we make a better selection of students if we combine medical aptitude tests and the vocational interest test? Let me state the problem in these terms: On the basis of faculty actions and attitudes, it seemed that ten or twelve of the lowest standing men in the class are not particularly desirable material for medical school. By setting a sufficiently rigorous criterion, the 70th percentile on the medical aptitude test, twelve of these lowest standing twenty men could have been excluded. However, in doing this, we would also have excluded 42 per cent of the remainder of the class. Obviously, this is a procedure that would defeat its own purpose since many high ranking students would have been eliminated by this criterion.

By combining the results of the medical aptitude test and the Strong Vocational Interest Test, selection could have been improved materially. The basis for this combination of data, as fitted to the Washington University situation, is as follows: (1) acceptance of those individuals in the T+, M+, and M groups, who are otherwise qualified, and (2) acceptance of those individuals in the T and C groups who score above the 70th percentile on the medical aptitude test and who are otherwise qualified. By these criteria fourteen of the lowest standing twenty men would have been excluded, while only 11 per cent of the remainder of the class would have been lost. Only one person who stood in the upper half of the class would have been prevented from registering.

The Strong Vocational Interest Test promises to give valuable information on certain of the non-intellectual factors that relate achievement in medical school. The present report of these findings is tentative since it is necessary to determine how well these criteria can be validated on another group of students in this school or in some other school, and to determine their validity for the clinical subjects.

The remaining data concern achievement in individual courses. In anatomy we find that the T+ individuals from whom we might have expected much, do relatively less well in anatomy than in the work of the year as a whole (Fig. 4). The T group is distinctly at or below the median of the class. By contrast, the M+ group has achieved exceedingly well in anatomy. This performance is all the more striking in reference to the mediocre knowledge of zoology which this group demonstrated on admission to the medical school. The C group makes distinctly poor progress in anatomy. Figure 5 presents similar distributions for histology and for neuroanatomy. The poor performance of the T group and the C group in histology should be noted. In neuroanatomy the distributions for the several groups are quite similar. The data for biochemistry and medical psychology is summarized in figure 6. In biochemistry, the T+ and M+ individuals are outstanding. The majority of the low standing individuals come from the T and C groups.

The distribution in medical psychology is interesting in another regard. It shows a bimodal distribution, especially in the T+ and M+ groups. In teaching this course, emphasis has been placed on feelings of security and of anxiety as features of personality development that are intimately related to

cultural, economic and family backgrounds. Some students find the material acceptable and interesting. Others do not. This bimodal tendency is particularly marked in the T+ and M+ groups. The T group is uniformly low in performance. The C group, in contrast to its poor performance in the morphological sciences, does somewhat better in medical psychology. These differences in performance raise interesting questions as to methods of teaching and the significance of particular course content and of instructors attitudes for different types of students.

Figure 7 presents the interest patterns of three medical students, and illustrates a significant application of the data from the Strong Vocational Interest

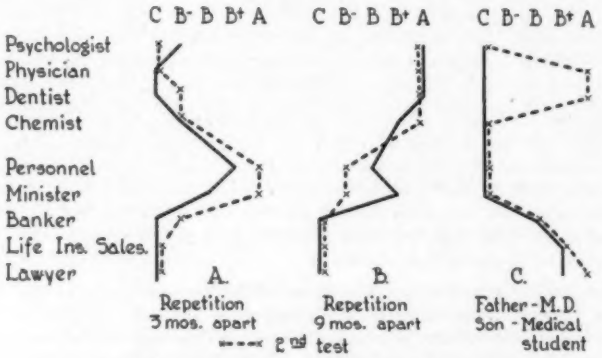

FIG. 7.—A and B. Variation in interest pattern on repetition of test. C. Comparison of interest patterns of father and son.

Test. Individuals "A" and "B" are shown to demonstrate the consistency of interest pattern. "A" stood in the lowest fourth of the class. It was a question at the time of admission whether he should have been accepted. The interest pattern was uniformly low in the technical field, high in personnel and minister, and low in banker, life insurance salesman and lawyer. The question arose—How reliable was the observation? The heavy line is the profile before admission to school; the dotted line is based on a test taken three months after admission to the school. The dominant interest pattern is more clearly shown in the latter test.

"B" repeated the test nine months later with little change in the technical ratings. In the interest pattern characterized as a secondary pattern, i.e., personnel and minister, the fluctuation is somewhat greater. When the interest is definitely lacking for a given professional group: banker, life insurance salesman and lawyer, there is no change from the initial C rating. The third individual (C) illustrates a problem familiar to administrative officers. This boy was the son of a doctor and was admitted to the school after some pressure on the admissions committee. The young man did not do satisfactory work, standing in the lowest ten of the class. In talking with him about his interests, his comments were

essentially as follows: "I've got to be a doctor. I have the doctor's interests. I know what it means to be a doctor. Father is a doctor. I am like Father." As an experiment, he was asked to obtain the cooperation of his father in filling out an interest blank. The interest pattern of father and son are presented here. Both have B or A ratings as lawyers; B+ as life insurance salesmen; B as bankers; C as ministers and personnel managers; C as chemists; C as laboratory psychologists. The young man is right in saying, "I am like Father," except for the striking difference between father and son in the interest pattern characterizing physicians, for here the father ranks A but the son ranks C. We are studying the therapeutic effect of making this type of data available to the student in scholastic difficulty. In some instances it seems to help in making failure a little less bitter.

DISCUSSION

DR. EDWARD S. THORPE (University of Pennsylvania): The comments which Dr. Jacobsen has made are of great interest to me. I have been a member of the Committee on Medical Aptitude Test for a number of years. No one on that committee has any false illusions about the value of the medical aptitude test. We believe thoroughly that it has some value. Dr. Moss has pointed out time and again that the correlation value of that test is about .7, which is a fairly high rating. It shows a higher rating than does the correlation of premedical grades alone.

We who are struggling with this problem of the aptitude test are very receptive to suggestions. We are eager to make improvements in the test and also, if possible, to incorporate new elements of value into the test. We believe that a test which is the official test of the Association should be the best possible test that can be devised and operated. Perhaps some of the elements which are now included in the test have so little practical value that they should be discarded, and elements such as are contained in the Strong Test should be substituted. I hope that we can improve the aptitude test by methods of that type.

Some of the material presented by Dr. Jacobsen seems not only to be of great value in selecting medical students for admission to medical schools, but also of great value to deans and assistant deans and others in directing the pathways of our students once they have been admitted and are progressing with more or less success toward the M.D. degree. As we all know, when a man has his doctor's degree in medicine, there are many diversified fields of activity ahead of him. He can take many paths. It seems to me that a test of this kind has a greater field of usefulness with the boys who have been selected and who are going through the school, in directing them and advising them whether, for instance, they shall go ahead with an interest in some of the finest types or most intellectual types of medical practice, shall we say in neurology or psychiatry, or in some of the more mundane types of medical practice, shall we say, in anatomy or dermatology.

I confess my ignorance and confusion. I would like to ask Dr. Jacobsen whether he can inform us to a greater extent as to whether a Strong test or some test of that character, would not have greater value to the medical student, to the dean directing the medical students, in personnel work, in helping him to choose the right line, whether he is to be a surgeon or an internist or a dermatologist, or a hospital administrator, or a roentgenologist, or a pediatrician.

On the other hand, the medical aptitude test helps us to select boys who will be able to jump the hurdle of the medical course. It certainly is of greater value than scholastic

grades or college grades alone. We can pick boys better now, I think, for their ability to get through the medical course. We have, it is true, no very adequate tests for personality and character, and so forth. Personal interviews attempt to do something like that, but you know and I know how many mistakes we make. At the present time we do not have a perfect test for the selection of medical students. Some years ago, in discussing this testing business, I called attention to the fact that as far as I knew there had been only one perfect test, and I call attention to that today. That is the one which the well known Gideon used in selecting his troops.

DR. CARLYLE F. JACOBSEN: I would like to suggest the use of the Strong Vocational Interest Test both before and after the admission of students to the medical school. I might indicate the practice which we have this year followed at Washington University. We will have some index of its efficacy a year from now. We have obtained data on every applicant at the time that he completed his admission blank. We have generally accepted without further question those individuals who showed the interest pattern I indicated as T+ and as M+. When we find an individual who shows a C interest pattern, we do not make that a basis for rejection. Rather, we inquire further concerning this individual. One such person indicated last year a desire to go into industrial medicine. He had a C technical interest pattern. He was one of the highest standing men on the Thorndike test. He had never taken a course in zoology but he stood better in zoology than one-third of our students.

He had had a year of industrial experience. He knew what he wanted to do. We were very happy to get that man and we felt confirmed in our judgment when, on the personnel manager key he showed an interest pattern that was compatible with the type of work that he wanted to follow.

As to the question of further specialization, that is, using the Strong Test as a guide in specialization, certainly we can set up no hard and fast criteria, but I can indicate a trend shown in one specialized group. Ten of thirteen hospital superintendents show a C interest pattern in medicine and in the technical interests. Twelve out of thirteen showed A ratings as personnel managers. On the other hand, when we studied a group of neurologists and psychiatrists—although these two are frequently combined by a hyphen into the neuro-psychiatrist—we found little difference between these groups in terms of medicine, psychology and chemistry, but we did find a distinct difference between the two groups on the personnel manager key. About 60 per cent of the psychiatrists show a high rating in personnel management. No neurologist showed a similar rating as a personnel manager.

Study of Applicants for Admission to the Medical Colleges of the United States in 1941

FRED C. ZAPFFE
Secretary, Association of American Medical Colleges
Chicago, Illinois

This study is the source for answers to many questions asked by those interested in the first phase of medical education—the acceptance of students. Some of the questions asked are: How many students apply for admission to medical colleges each year? How many are accepted? How many women apply? How many are accepted? What has been the preparation of these students: two, three or four years of college work? Is any one of these groups discriminated against or favored? For what reason are applicants rejected? How important is scholarship in determining acceptance or rejection? Medical schools often ask for a check up on their freshman class. These cards give the answer. Although a great deal of work is done in making the study—both on the part of the medical schools and the office staff of the Association—it is well worth while. The study is the only source of all this information.

TABLE 1—SUMMARY OF TOTALS FOR FIVE YEARS OF ALL APPLICANTS

	1937	1938	1939	1940	1941
No. Applications	34,416	36,268	34,871	34,434	34,655
No. Applicants	12,207	12,131	11,800	11,854	11,940
Single Applicants	6,564	6,249	6,089	6,146	6,110
Accepted	3,423	3,117	3,064	3,161	3,341
	52.1%	49.9%	50.3%	51.2%	54.7%
Rejected	3,141	3,132	3,025	2,985	2,769
Multiple Applicants	5,643	5,882	5,711	5,708	5,830
Accepted	2,987	3,106	3,147	3,167	3,481
	52.9%	52.8%	55.1%	55.5%	59.7%
Rejected	2,656	2,776	2,564	2,541	2,349
Applicants Accepted	6,410	6,223	6,211	6,328	6,822
	52.5%	51.3%	52.7%	53.4%	57.2%
Applicants Rejected	5,797	5,908	5,589	5,526	5,118

Table 1 gives a summary of this study for the past five years for the purpose of making comparisons of figures. There has been very little change since 1937, except in the number of applicants accepted. In 1933, 62.1 per cent of all applicants were accepted, the highest for any year. In 1938, 51.3 per cent were accepted, the lowest for all years. In 1941, all medical colleges were urged to accept as many students as could be accommodated—as determined by facilities —without lowering standards of admission or of selection. As a result, 57.2 per cent of applicants were accepted.

It must be pointed out that this percentage includes duplicates. An applicant may have been accepted by more than one college. A check against this percentage is the enrolment in all medical colleges in the freshman year—the year on which this study is based. It does not include enrolment in other years. Of the total

number of applicants in 1941 (11,940), 52.3 per cent are enrolled as freshmen. Therefore, only 4.9 per cent of that number either had duplicate acceptances or they did not enroll. Some, if not all, of the latter group will probably enroll for the next session. The duplicate acceptances were, of course, in the multiple applicants group, which was somewhat larger in 1941 than in any previous year, except in 1938 when there were 52 more multiple applicants than in 1941. More multiple applicants had acceptances than in any previous year. This is no doubt due to the fact that the applicants wanted to make certain of acceptance by some medical college. The percentage of acceptance in this group in 1941 was 59.7. The lowest acceptance percentage was in 1936 (52.8).

Of the students who made only one application, 54.7 per cent were accepted. In 1935, there were 12,740 applicants (no duplicates): 7,231 made only one application; 5,509 made more than one application. In 1941, there were 6,110 single applicants and 5,830 multiple applicants, a decided drop in the former and an increase in the latter. The spread of years from 1935 to 1941 refutes the statement often made that decrease in numbers of applicants is due to a longer stay in college for the preparation for the study of medicine. It is a well known fact that the general economic status of the country has a bearing on the attendance in professional schools, especially medicine. When times are good, at-

TABLE 2—SUMMARY OF TOTALS FOR FIVE YEARS OF WOMEN APPLICANTS

	1937	1938	1939	1940	1941
No. Applications	1,397	1,491	1,536	1,621	2,283
No. Applicants	649	642	632	585	636
Single Applicants	398	354	377	341	360
Accepted	209	165	174	178	180
	52.3%	46.6%	46.1%	52.2%	50.0%
Rejected	89	189	203	163	180
Multiple Applicants	251	288	255	244	276
Accepted	132	157	147	125	145
	52.6%	54.5%	57.6%	51.2%	52.2%
Rejected	119	131	108	119	131
Applicants Accepted	341	322	321	303	325
	52.4%	50.0%	50.8%	51.8%	51.1%
Applicants Rejected	308	320	311	282	311

tendance falls off; when times are bad, attendance rises. The rise in 1941 no doubt is due, in large part, if not entirely, to the fact that a drive was made to increase enrolment, not by any lowering of standards, as has been said, but by accepting more worth while applicants. All medical colleges have a quota which is determined by facilities. Every one knows that when unusual circumstances exist, such as the war today, it is possible to stretch facilities a bit. That has been done. Only a very few schools could not increase their enrolment. Some schools added one or two, some more than that number. It must be emphasized that in no instance was there any lowering of standards.

Table 2 presents the data for five years as they concern the women students. While the total number of women applicants was greater in 1941 than in 1940 (636:585) there is little variation from previous years. In 1937, the women

applicants numbered 649—the high for all years. The largest acceptance was in 1936 (56.6 per cent); the lowest, in 1938 (50. per cent). The acceptance for 1941 (51.1 per cent) is about average. During the five year period covered in table 2 there is small variation in any of the figures shown.

Table 3 presents data on acceptances on the basis of years of preparation in college for the study of medicine. Inasmuch as the minimum requirements for admission to medical school are two years of college work—with prescription of certain subjects which are fundamental to medicine—we still find students in medical school who have not had more than the required work. However, year by year, the number of these students has grown smaller. In the present (1941-1942) freshman class, only 1.4 per cent (89 students) fall into this category—and many of these have had more than 60 college hours. Some have taken summer courses and have brought their credits up to as high as 72 hours. Many medical colleges whose admission requirement is two years of college work do not accept any applicants of this group because they can fill their quota with students having had more college work.

TABLE 3—DATA ON ACCEPTANCES ACCORDING TO YEARS OF COLLEGE WORK—1941

	Single Applicants		Multiple Applicants		
1941	Accepted	Rejected	Accepted	Rejected	Totals
2-3 years	103	125	99	130	457
3-4 years	1,095	760	1,069	645	3,569
4 or more years	184	256	202	268	910
A.B. Degree	1,052	857	1,190	690	3,789
B.S. Degree	835	549	857	592	2,833
Other Degrees	9	17	13	23	62
Not Stated	63	205	51	1	320
	3,341	2,769	3,481	2,349	11,940

Of the 11,940 applicants in 1941, 3.8 per cent of acceptances of two year college students are reported. This represents applicants who have been accepted by more than one medical college. Of the 457 applicants, 202, or 44.2 per cent, were accepted—again including multiple acceptances. Only 89 students in this group were enrolled, representing less than one-half of the total acceptances. It must be stated, however, that not all accepted applicants enroll. Of the total number of all applicants (11,940), 57 per cent of acceptances were reported but only 53 per cent of enrolments. In other words, 4 per cent either were duplicate acceptances or represented students who did not enroll.

In the group of applicants who had three or more years of college work there were 4,479 acceptances of the total number of 11,940 applicants, or 37.5 per cent. This group accounts for 54.7 per cent of all acceptances. Only 2,382 students of that group enrolled, or 53.1 per cent of the group, represented by 38.0 per cent in the 1941 freshman class.

There were 6,622 applicants with a bachelor's degree, or 55.4 per cent of all applicants. In 1940, 64.5 per cent of the applicants who had a bachelor's degree enrolled. The A.B. applicants accounted for 31.7 per cent; the B.S. applicants for 23.7 per cent. Approximately 60.0 per cent of both groups were accepted and the same percentage enrolled.

Each year the largest number of acceptances which are not followed by enrolment is in the three or more years group. Apparently, applicants in this group are anxious to know whether they have a chance of being accepted. They expect to finish college and receive a degree. If accepted, they may go on the list for the next, succeeding, year, or they will apply again feeling certain of being accepted.

Actually only one medical college does not deviate from the requirement of a bachelor's degree for admission, but a number of colleges, with a three years of college work requirement, are able to select their class entirely from degree holding applicants. However, they leave the door open, as it were, for the acceptance of an applicant with a high scholarship who does not hold a degree but who, it is felt, will make an excellent medical student. Thus, in such a case, published admission requirements need not be lowered.

TABLE 4—DATA BY COLLEGES ON TOTAL NUMBER OF APPLICATIONS MADE AND ACCEPTANCES AND REJECTIONS (MEN AND WOMEN)

	Applications			Students
	Accepted	Rejected	Total	Enrolled
Alabama	75	311	386	60
Arkansas	85	104	189	82
College Medical Evangelists	84	67	151	82
California	72	196	268	73
Southern California	57	235	292	56
Stanford	88	251	339	62
Colorado	80	29	109	58
Yale	64	417	481	50
Georgetown	130	423	553	80
George Washington	141	595	736	78
Howard	89	240	329	80
Emory	87	177	264	68
Georgia	88	53	141	77
Oglethorpe	88	48	136	66
Chicago Medical	106	76	182	72
Chicago	106	677	783	65
Illinois	162	318	480	170
Loyola	117	419	536	85
Northwestern	178	991	1169	129
Indiana	149	741	890	140
Iowa	106	59	165	100
Kansas	94	119	213	72
Louisville	151	528	679	95
Louisiana	132	377	509	98
Tulane	203	560	763	140
Johns Hopkins	102	276	378	75
Maryland	122	172	294	103
Boston	109	266	375	69
Harvard	144	581	725	117
Tufts	141	198	339	111
Michigan	188	413	601	135
Wayne	90	83	173	69
Minnesota	124	84	208	102
Mississippi	40	13	53	30
Missouri	48	40	88	36
St. Louis	233	829	1062	123
Washington	146	515	661	80
Creighton	102	147	249	70
Nebraska	112	54	166	90

	Applications			Students
	Accepted	Rejected	Total	Enrolled
Dartmouth	23	122	145	22
Albany	85	468	553	47
Buffalo	104	567	671	79
Columbia	279	1003	1282	126
Cornell	140	915	1055	83
Long Island	172	725	897	108
New York Medical	87	635	722	96
New York University	128	693	821	134
Rochester	91	466	557	67
Syracuse	55	385	440	51
Duke	99	596	695	74
North Carolina	50	118	168	45
Bowman-Gray	52	141	193	43
North Dakota	28	89	117	27
Cincinnati	158	536	694	82
Ohio	82	172	254	84
Western Reserve	145	641	786	87
Oklahoma	78	83	161	65
Oregon	83	155	238	72
Hahnemann	210	462	672	149
Jefferson	189	479	668	141
Pennsylvania	170	948	1118	129
Pittsburgh	110	215	325	87
Temple	119	968	1087	110
Woman's	65	77	142	41
South Carolina	52	331	383	51
South Dakota	27	74	101	26
Meharry	104	99	203	65
Tennessee	210	294	504	63
Vanderbilt	56	434	490	52
Baylor	105	161	266	84
Texas	112	149	261	115
Utah	43	44	87	38
Vermont	33	55	88	33
Medical College of Virginia	117	450	567	87
Virginia	100	281	381	75
West Virginia	38	39	77	30
Marquette	154	372	526	98
Wisconsin	75	70	145	76

Table 4 shows how many applicants were reported by each medical college; how many were accepted and rejected and how many actually enrolled. Here, too, an explanation of the figures must be given. For instance, a college accepts 75 applicants but enrolls only 60. The college is aware that if it is to fill its quota—determined by facilities, equipment and personnel—it must accept more applicants than will enroll. As stated previously, a student is eager of acceptance. He has decided on the college of first choice, to which he makes application. Then he applies to one or more other colleges to make certain that he will get in somewhere. If accepted by the college of first choice, he enrolls there. If not accepted, he will enroll elsewhere—if he has been accepted. Then, too, colleges may place the extras on a waiting list from which vacancies can be filled if an accepted applicant has enrolled elsewhere. The students on the waiting list may be given an opportunity to enroll the following year if they have failed of acceptance elsewhere.

It is evident that all of this entails an enormous amount of work on admissions committees. Each application and the accompanying credentials are scanned very carefully to ensure good selection. Credentials are checked with the issuing authority, or should be, which calls for much correspondence. Some colleges demand that a photograph of the applicant accompany the application. If an applicant makes 44 applications, the high for 1941, it is a considerable drain on his resources and a strain on the college which supplies him with copies of his record.

In 1941, six colleges reported more than 1,000 applications, the high being 1,282. Many colleges will not consider additional applications once they have filled the quota set for acceptances. Then, too, some colleges will not consider out of state applications—which accounts for the small number of applications reported by some colleges. Colleges which will accept only a small number of students are not likely to have a large number of applications. All these facts are known to prospective medical students. The number of applications made to the so-called two year schools of medicine naturally will be smaller than in the case of the four year schools. The location of the school also is reflected. Schools located in large cities receive more applications than do the schools located in small cities. Reputation of a school also is a factor. Some schools are better known than others. Again, the student may feel that this or the other school is hard to get into; so he does not apply there. Many other factors which have a bearing on application could be mentioned, but why prolong the discussion?

TABLE 5—DATA ON 5,830 MULTIPLE APPLICANTS
NUMBER OF APPLICATIONS MADE, ACCEPTANCES AND REJECTIONS

1855 made 2 applications each
- 713 had no acceptances
- 834 had 1 acc
- 308 had 2 acc

1090 made 3 applications each
- 427 had no acceptances
- 437 had 1 acc
- 174 had 2 acc
- 52 had 3 acc

784 made 4 applications each
- 290 had no acceptances
- 290 had 1 acc
- 154 had 2 acc
- 44 had 3 acc
- 6 had 4 acc

520 made 5 applications each
- 197 had no acceptances
- 194 had 1 acc
- 88 had 2 acc
- 35 had 3 acc
- 11 had 4 acc

353 made 6 applications each
- 155 had no acceptances
- 118 had 1 acc
- 47 had 2 acc
- 22 had 3 acc
- 9 had 4 acc
- 2 had 5 acc

263 made 7 applications each
- 127 had no acceptances
- 85 had 1 acc
- 32 had 2 acc
- 12 had 3 acc
- 3 had 4 acc
- 4 had 5 acc

186 made 8 applications each
- 71 had no acceptances
- 69 had 1 acc
- 25 had 2 acc
- 15 had 3 acc
- 4 had 4 acc
- 2 had 5 acc

156 made 9 applications each
- 71 had no acceptances
- 44 had 1 acc
- 26 had 2 acc
- 9 had 3 acc
- 4 had 4 acc
- 2 had 5 acc

121 made 10 applications each
- 50 had no acceptances
- 47 had 1 acc
- 12 had 2 acc
- 8 had 3 acc
- 2 had 4 acc
- 1 had 5 acc
- 1 had 8 acc

101 made 11 applications each
53 had no acceptances
30 had 1 acc
10 had 2 acc
6 had 3 acc
2 had 4 acc

74 made 12 applications each
35 had no acceptances
25 had 1 acc
12 had 2 acc
1 had 3 acc
1 had 5 acc

43 made 13 applications each
24 had no acceptances
16 had 1 acc
2 had 2 acc
1 had 3 acc

56 made 14 applications each
30 had no acceptances
18 had 1 acc
4 had 2 acc
4 had 3 acc

42 made 15 applications each
22 had no acceptances
15 had 1 acc
5 had 2 acc

34 made 16 applications each
20 had no acceptances
7 had 1 acc
4 had 2 acc
3 had 3 acc

25 made 17 applications each
10 had no acceptances
9 had 1 acc
5 had 2 acc
1 had 5 acc

25 made 18 applications each
15 had no acceptances
6 had 1 acc
3 had 2 acc
1 had 3 acc

18 made 19 applications each
14 had no acceptances
3 had 1 acc
1 had 2 acc

14 made 20 applications each
9 had no acceptances
4 had 1 acc
1 had 3 acc

12 made 21 applications each
7 had no acceptances
4 had 1 acc
1 had 4 acc

9 made 22 applications each
4 had no acceptances
4 had 1 acc
1 had 4 acc

11 made 23 applications each
5 had no acceptances
2 had 1 acc
4 had 2 acc

11 made 24 applications each
9 had no acceptances
1 had 1 acc
1 had 2 acc

6 made 25 applications each
3 had no acceptances
3 had 1 acc

3 made 26 applications each
1 had no acceptances
2 had 1 acc

2 made 27 applications each
1 had no acceptances
1 had 2 acc

4 made 28 applications each
No acceptances

1 made 29 applications
1 acceptance

4 made 30 applications each
1 acceptance each

1 made 31 applications
1 acceptance

3 made 33 applications each
No acceptances

1 made 34 applications
1 acceptance

1 made 37 applications
1 acceptance

1 made 44 applications
No acceptances

Table 5 presents the data on the multiple applicants. About 32 per cent of the multiple applicants made two applications and about 62 per cent of these were accepted. About 18 per cent made three applications; about 40 per cent resulted in acceptances. From there on both the number of multiple applications and the acceptances grow smaller. The student who made 44 applications did not get a single acceptance.

The students (8) who made 29, 30, 31, 34 and 37 applications, respectively, each had one acceptance. One student made 33 applications and failed of being accepted. Many of these high multiple applicants try again year after year. One such student made 70 applications in three years and failed of acceptance. He

went to Scotland. That desirable students do make multiple applications is shown by the fact that many applicants have as many acceptances as they made applications, although the number of such instances dwindles rapidly as the number of applications made increases. All these facts are set forth clearly in table 5.

TABLE 6—GEOGRAPHIC DISTRIBUTION OF ALL APPLICANTS

	Single	Multiple	Total
New York	719	1270	1989
Pennsylvania	429	560	989
Illinois	424	313	737
California	324	382	706
Ohio	238	338	576
New Jersey	169	342	511
Texas	254	208	462
Massachusetts	157	245	402
Indiana	259	116	375
Michigan	206	139	345
North Carolina	140	100	240
Georgia	127	107	234
Wisconsin	152	74	226
Minnesota	155	49	204
Louisiana	151	48	199
Tennessee	141	52	193
Missouri	116	71	187
Iowa	142	44	186
Alabama	107	75	182
Virginia	127	53	180
West Virginia	80	81	161
Oklahoma	99	60	159
Connecticut	57	98	155
Maryland	91	59	150
Washington	45	102	147
South Carolina	79	67	146
Kentucky	89	53	142
Florida	76	64	140
Nebraska	109	29	138
Kansas	100	33	133
Colorado	76	41	117
Mississippi	69	43	112
Arkansas	92	19	111
Oregon	64	46	110
District of Columbia	76	28	104
Utah	50	53	103
South Dakota	44	10	54
Idaho	16	35	51
New Hampshire	20	29	49
Rhode Island	13	35	48
North Dakota	37	11	48
Vermont	29	12	41
Maine	13	23	36
Arizona	10	23	33
Delaware	11	14	25
Montana	10	14	24
Wyoming	9	10	19
New Mexico	10	8	18
Nevada	—	2	2
Alaska	2	3	5
Hawaii	11	26	37
Foreign Countries			
Canada	6	8	14
Mexico	6	1	7
Africa	1	3	4
Asia and Orient			
China	4	6	10
India	1	1	2
Iran	2	—	2
Japan	1	1	2
Palestine	—	1	1
Central & South America			
British Guiana	—	1	1
Canal Zone	—	2	2
Columbia	1	1	2
Costa Rica	—	1	1
Panama	1	1	2
Peru	2	9	11
Venezuela	1	—	1
Europe			
Germany	1	—	1
Norway	1	—	1
Switzerland	1	3	4
Wales	1	—	1
West Indies			
Cuba	2	—	2
Puerto Rico	55	80	135
Virgin Islands	—	1	1

Table 6 shows the geographic distribution of the applicants. This list varies little from year to year as is to be expected. The number of applicants coming from the various states represents well the order of states as based on population, with few exceptions. Perhaps the number of colleges and universities in a state is reflected in these figures. It must be stressed that the number of applicants from a state has no bearing on the subsequent increase of the number of practitioners of medicine in that state. So far as medical colleges are concerned, that

statement is particularly true of the endowed schools. Students attending a state university medical school are more likely to remain to practice in that state than are the students attending an endowed school in the same state.

So far as the foreign countries are concerned, the students coming from these countries are, in the main, residents of the United States. The foreign country is the country of birth. Puerto Rico is an exception because it does not have a medical school. Students coming from Puerto Rico usually return there to practice. There is not yet an interchange of medical students between the United States and the Latin American Republics, hence none of these students are "exchange" students.

This study, as stated previously, presents a wealth of information not obtainable elsewhere. Many medical colleges want a check up on the application record of the freshman class. Often pressure is brought to bear on a medical college to admit a student whose record is not of the best. He may or may not deny having previously made application to a medical school in any year. This study gives exact information on that point and often has been a valuable ally of the admissions committee when admission was refused. It also aids in detecting a repeater who has secured admission by fraud, denying previous attendance in a medical school. The application cards may tell a different story.

Grateful acknowledgment is made to all the medical schools who have given valuable assistance in the making of this study and assurance is given that it was well worth while.

Loan Funds Versus Scholarships for Medical Students*

WILBURT C. DAVISON
Dean and Professor of Pediatrics, Duke University School of Medicine
Durham, North Carolina

Everyone is agreed that more physicians are necessary for military and civilian service, and the Government and Foundations will be asked for financial help for the increased number of medical students who will need it. Therefore the question of loan funds versus scholarships should be faced.

Probably the best way by which a sufficient number of students can attend medical school is through interest bearing loan funds, which can be repaid over a period of years, and thus become available for future students. Scholarships, such as those of the Commonwealth Fund for students who agree to practice in the country, are splendid and have demonstrated their success, but require too great an outlay to be available widely, and usually do not create in graduates a healthy sense of obligation toward their community and university. Scholarships also encourage perjury about financial resources in applications by students who are not in need, and often create ill feeling between unsuccessful and successful applicants. On the other hand, students do not apply for interest bearing loans unless they need them. In addition, the same amount of money as scholarships will help far fewer students. For example, if the annual scholarship fund is $12,000, twenty-four $500 scholarships can be established. As soon as they are awarded, the money is gone. However, if twenty-four $500 loans at 6 per cent are granted, the interest each year will provide an additional loan, and at the end of ten years, judging by the experience at Duke University, a substantial portion of the original $12,000 will be repaid and available for another group of students.

The argument sometimes advanced in favor of scholarships is that graduates who have loans often are forced by their debts into immediate practice and the charging of exorbitant fees, or to take inferior salaried positions, instead of spending a long postgraduate period in hospitals which do not pay them very much but which give them much more in the way of training. However, Duke students who have had loans have not curtailed their postgraduate training. Seventy-nine per cent of the graduates have spent more than the required two years in hospital internships and residencies.

Although the medical students at Duke University pay only 28 cents of every dollar of medical school expenses,[1] 49 per cent of the 250 students enrolled are unable to study medicine without financial assistance.[2] An annual loan fund of less than $12,000 has enabled all these students to remain in school. However, during the war the four quarter schedule, which formerly had been optional, has

---

*From the Duke University School of Medicine, Durham, N. C.

1. Student tuition is only 9.3 per cent of the combined costs of the teaching hospital and medical school.

2. Davison, W. C.: The First Ten Years of Duke University School of Medicine and Duke Hospital, N. Carolina M. J. 2:527-532 (Oct.), 1941.

been made compulsory and all students must now attend medical school continuously, so a larger loan fund is necessary. An analysis of the present student needs indicates that fifty-five have been gainfully employed during each of the former summer vacations, and earned an average of $175 over and above their expenses. In other words, the compulsory accelerated program will require an annual addition to the loan fund of $9,625 making a total of $21,625.

From this loan fund, Duke students, after their first year, may borrow up to $450 per year ($600 annually during the war) at 6 per cent, and the repayment of the principal does not start until the graduate completes his medical and hospital training, and extends over the first five years of practice. Ten years is the shortest time in which the final repayment is due, i.e., three years in medical school, two years or more of internship and residencies, and 2 per cent repayment per month for the first five years after starting practice. During the war, the repayment of loans will be simplified because most of the graduates after their first year of internship will take Army or Navy Medical Corps commissions with $2,000 salaries plus $696 to $1,152 for rental and subsistence.

Entering students are not eligible for loans because their aptitude for medicine cannot always be determined until after their first year. Furthermore, their families or communities should demonstrate their faith in them by helping them get started.

Six per cent interest is charged on the Duke loans to cover the cost of the administration of the loan fund, to replace losses, to discourage students from borrowing except as a last resort, and to encourage them to obtain funds from their families.

The record at Duke for 11 years indicates that an average of 4.66 of the 6 per cent interest charged is collected, that 2 per cent covers the losses, and another 1 per cent the cost of administration of records, collections, etc,[3] thereby increasing the funds available for loans by at least 1 per cent net each year. Medical students can and do repay their debts, though they rarely realize that scholarships represent loss of university income and also should be repaid.

---

3. From 1930 to 1941, the Angier B. Duke Fund has loaned $116,835, or an annual average of $10,621.36 to 371 medical students, or 49 per cent of those graduated during this period. These 371 loans have varied in accordance with individual needs from $100 to $1,500. Although most of the loans still have several years to run before coming due, $39,320.15 has been repaid on the principal; $29,008.84 also was paid as interest. The maximum amount of capital required to provide an adequate loan fund during these 11 years was $48,506.01 ($116,835, less principal and interest payments), which is being repaid at interest, while $116,835, which would not be repaid, would be needed to help a similar number of students by scholarships.

The Neglected "Premedics"

ARTHUR M. LASSEK
Professor of Anatomy, Medical College of the State of South Carolina
Charleston, South Carolina

I believe that a cardinal policy of American medicine should be to reach the prospective medical student as early in his career as possible. As a step in this direction, the "premedic" students of the United States could be officially recognized and accepted by the medical profession from year to year. The "premedics" have overtly signified their intention of joining us, but we, as a whole, remain aloof. These students represent a very important element to medicine, for obvious reasons. There is probably unanimous agreement among medical teachers that the average "premedic" student arrives at the door of the medical school unprepared and with no background in the professional values of medicine. It is well known that many promising "premedic" students transfer to business and other graduate schools. At present, the "premedics" are comprised of heterogeneous groups scattered over the states with no national organization or aims. In many sections of the country, they function only as social clubs. Most important, they represent the future doctors of our country and what they think and believe may be important for years to come. For these reasons, they merit, not a passive, but an active interest from us at all times but especially during this unusual period in the history of medicine.

It must be admitted that the present relation between medical schools and medicine, on the one hand, and "premedics," on the other, is not an intimate or cordial one. Outside of partial regulation of subjects, which have become frozen in the undergraduate curriculum, and the requirement to take an "aptitude test" they are left to shift for themselves. Interest in them currently centers around the values of the scientific versus the liberal "premedic" education. What the "premedics" learn about medical schools and medicine is largely from gossip, laymen's magazines, novels or the cinema.

It is well recognized that it is a big leap from college to medical school. The entering freshmen are immediately confronted with different responsibilities. There is a change in the quality and quantity of subject matter which includes about 5,000 Greek and Latin terms and the practical dissection of human cadavers. The competition is keen and the tempo is rapid and regulated with military routine regardless of the intellectual and emotional preparation of the

students. Because of these factors, the freshman medical teacher must allow a period for orientation and adjustment.

It certainly cannot be the fault of the student that he often begins his medical work confused and apprehensive. He is the product of our educational system, both home and school. His initial performance in the classroom will depend on habits formed over many years of attendance in the elementary and secondary schools. Honest admissions by many students after the completion of their first year is that they had failed to understand the fundamental laws of learning and had not learned to develop fully their powers of observation. They also readily admit they had little or no opportunity to understand the values or aims of the medical profession. Not many teachers in the colleges and universities have ever set foot in a medical institution, conversed with medical educators or studied medical education. I believe that if prospective medical students were given some standards which emanated from the profession they would rise to the occasion. They are hungry for attention and eager for facts. They do not like the term "premedic" and they have difficulty in understanding what is the relation of their courses to medicine.

Mere recognition and acceptance of the "premedics" of America by our medical profession would, I believe, produce a stimulating and lasting effect on each student. Every person inherently desires prestige and recognition. I am sure such an action would create a sense of junior membership and more interest and pride in their chosen careers at an important moment. They would feel that they were serving their apprenticeship, which, in actuality, they are. Such a policy would be easy of attainment. It would tend to neutralize the transfer of many outstanding "premedic" students to business and graduate schools. If the "premedics," possibly 20,000 strong, had a national organization, they would undoubtedly turn to the medical profession for acceptance and recognition.

If a more extensive program were desired, there could be formed a medical information center which would be available to all "premedic" students. Communication might be maintained between such a center and the various presidents of the "premedic" societies throughout the country. Teachers and practitioners of known oratorical ability, with a background in medical education, might be selected impartially in various regions of the United States to speak to "premedic" clubs in their vicinities. Qualified men might be appointed as full time representatives whose duties would be to contact and to speak to as many clubs as possible. Some other approach might be more effective. The dominating motives of all intercourse might be the following: official welcoming into the profession, presenting the highlights of medical education, stressing medical history and ideals

and the outlining of a goal. Every opportunity should be given "premedics" to observe doctors at work in medical schools, in their laboratories and on their rounds. The strength of medicine lies in its principles and these cannot be emphasized and instilled too early. Possibly suggested readings in medical literature could be incorporated into the English courses. There should be no direct interference with the "premedic" curriculum.

It may be advanced that any such plans are not feasible because of the time and expense involved. Far less important organizations expend much energy and hundreds of thousands of dollars annually in searching for and teaching talent. Baseball is a good example. If necessary, I feel sure that "premedic" students would wholeheartedly and voluntarily pay small annual dues to help support a central information bureau.

I believe that in the future medical educators will insist that a background in medicine should begin earlier than is the case at present. The far reaching importance of youth training has been recognized by regimes in political control in other countries. With the rapidly increasing volume and complexity of medical subjects, medical education must, of necessity, be a long range program. The saturation point has been reached in respect to absorption and digestion of medical information over a four year period. A start can be made in bridging the wide gap between college and medical education by extending a friendly and encouraging hand to that important and neglected group, the future doctors of our nation.

A Travelogue of Virginia Medical History*

WYNDHAM B. BLANTON
Professor of Clinical Medicine, Medical College of Virginia
Richmond, Virginia

I

I have been asked to serve as a sort of medical Baedeker this morning, and to tell you some of the things you should see if you propose to take a medical history tour of Virginia. I shall proceed topically, rather than geographically, in indicating to you a few of the high lights of our three centuries of medical history.

If your interest is primarily in medical education, you will find among us no milestones, or landmarks of the preceptorial apprentice system which existed in Virginia, as everywhere else, up to the Nineteenth Century. The first organized effort at medical education in this state was made at Williamsburg. If, while there, you will walk into the Wren Building at William and Mary College, that beautiful Rockefeller restoration of the work of the architect of St. Paul's Cathedral in London, and look about you, you can be sure you are standing where James McClurg, M.D., graduate of Edinburgh, member of the Constitutional Convention of 1787, gave, from 1779 to 1782, the first formal lectures on medicine given in Virginia, a brief and abortive attempt, but nevertheless, the first.

Then, to be chronologically correct, you must journey to Charlottesville, to that lengthened shadow of Thomas Jefferson, the University of Virginia. There, in 1825, Robley Dunglison, freshly imported from England, single handed taught all there was to be taught of medicine, occupying, apparently, not a chair, but a settee. Later he was joined by John Emmett and Thomas Johnson. You would be just a little too late, however, to see the old Anatomical Hall, because physical progress had to wreck, in 1939, their earliest landmark of medicine. To call the roll of a few of the men who taught at the University of Virginia is sufficient. James Lavin Cabell, organizer and first president of the National Board of Health; Robert Griffith, who later distinguished himself at the University of Pennsylvania; John Staige Davis, father and son; John Smith, inventor of the inverted microscope; and William Dabney, who first described pleurodynia.

To keep in step with the sequence of events, you must now journey to Winchester in the Valley of Virginia. Here, on December 30, 1825, John Esten Cooke, Hugh Holmes McGuire and Alfred T. McGill established a medical school, which after a bad start, got off to a flourishing career lasting until the Civil War. Just before the war, its medical students carried their necessary body snatching to Harper's Ferry, laying hold of the body of no less distinguished

*Read at the Fifty-second Annual Meeting of the Association of American Medical Colleges, held in Richmond, Va., October 27-29, 1941.

a person than the son of John Brown. It was this skeleton, preserved in the anatomic department of the college, which later enraged Federal troops and led to the burning of the college by General Banks. You will find, reminiscent of this school, only a tablet on a house on the corner of Water and Stewart Streets marking its former site.

For the next Virginia venture in medical education you must go to Worsham. Here the Mettauer family organized, in 1837, the Prince Edward Medical Institute, which, in 1847, became the medical department of Randolph-Macon College. John Peter Mettauer, A.M., M.D., LL.D., was professor of surgery and of clinical medicine. His son, Francis J. Mettauer, A.M., M.D., taught anatomy, physiology and chemistry, and his son, Henry Archer Mettauer, M.D., taught therapeutics, materia medica, midwifery and medical jurisprudence. Mettauer, the father, was a unique figure, tall, austere, with black eyes and shaggy eyebrows, business-like, studious, taciturn, with many eccentricities and few intimates. His surgical genius carried his reputation into adjoining states. He described the successful cure of vesicovaginal fistula in the *Boston Medical and Surgical Journal,* in 1840, several years before Marion Simms made his claims.

The school of the Mettauers continued almost until the Civil War, closing its doors, never to open them again. If you search for the remains of this school today you will find only an overgrown field. Its chartering college, Randolph-Macon, still flourishes in Ashland, Virginia, but there is nothing there to suggest the connection. However, you may see the cupola of Mettauer's building, much nearer at hand; in fact, it is in the court yard of the library of the Medical College of Virginia.

And now we must come back to Richmond, where the Medical College of Virginia spreads itself like a green bay tree. It was organized in 1838 as the Medical Department of Hampden-Sydney College. You will have to go to Nineteenth and Main Streets to find the site of our college's first building, the old Union Hotel. It has long since been replaced by more modern business houses. The next home, the old Egyptian Building, erected in 1845, housed class rooms, laboratories and infirmary under one roof. A magnificent structure then, today it is said to be the finest existing example in this country of the Egyptian revival in architecture. It has recently been restored without, and remodelled within, through the munificence of Mr. Barney Baruch as a memorial to his father, Dr. Simon Baruch, who was once a student in its halls.

Before leaving medical education in general, and the Medical College of Virginia in particular, if you will stand before McGuire Hall on East Clay Street, in which much of our formal teaching now goes on, you will see a building erected by Richmond's second medical foundation, the University College of Medicine, after fire destroyed its first building. This was the latest attempt at a separate medical college in Virginia. It was the creation of Hunter McGuire, in 1893, and represented a rival to our College until the fortunate amalgamation of the two in 1913.

II

If you like old apothecary shops—carboys, pungent odors, scales, mortars—all the fascinating equipment of the early American drug store, you will find in Virginia several very interesting examples. In Williamsburg, on the Duke of Gloucester Street, at the Sign of the Golden Ball, is the site of an old pharmacy shop dating from about 1760, recently restored by the Restoration and originally kept by Dr. George Gilmer, Jr. On the Palace Green, three squares away, is the site of his father's shop, known to have been in operation in 1751. Around the corner, and back down Duke of Gloucester Street, you will come to the sites of Dr. Archibald Blair's shop, 1717, the Sign of the Rhinocerus, 1762, Dr. Robert Davidson's shop, 1737, and Dr. John Galt's shop, 1769. It is regretted that none of these Williamsburg shops have been restored within.

In Fredericksburg there is a quaint old building lately taken over by the American Pharmaceutical Association, the apothecary shop of General Hugh Mercer. It is a story and a half building at the corner of Main and Amelia Streets. On the same old shelves that line the walls are the handblown bottles, Eighteenth Century scales, colored carboys, mortars, firkins, and assorted vials that Dr. Hugh Mercer left when he went away to join the army of Washington. You will remember him as the hero of the Battle of Princeton where he lost his life in 1771.

The Bond Drug Store, at the corner of Caroline and William Streets, celebrated this month its one hundred and fiftieth anniversary. It was opened in 1791 by Dr. Elisha Hall with equipment purchased from the widow of General Hugh Mercer. The original iron mortar and pestle, and large cut glass bottles are still to be seen in this store which boasts that "it remains undefiled by the march of progress."

In Alexandria there is an apothecary shop you should not miss, long known as the Leadbetter Drug Store. It was established in 1792 at the corner of King and Fairfax Streets. Some of the old equipment is still there, as well as many prescriptions written by well known doctors of that day, and letters from some of its famous patrons asking for various articles to be delivered to them by messenger. Here, for example, Mrs. George Washington sent her negro boy for castor oil. Here Webster, Clay and Calhoun foregathered. It is related that Robert E. Lee was sitting here when orders reached him to proceed to Harper's Ferry and arrest John Brown.

Perhaps the most completely equipped apothecary shop of one hundred years ago is to be found conveniently right here in Richmond, preserved in the basement of our college library. It is a restoration of James F. Roy's shop in Fredericksburg, with the original prescription counter and drawer in which drugs were kept. Large containers filled with snuff are here also, so placed that customers might take a pinch while waiting. Enormous files of original prescriptions hang from hooks on the walls and a unique display of pigments is to be seen on the shelves, for it will be recalled the old apothecary shop was often a place where paint of any desired color was adeptly mixed by a versatile pharmacist.

III

George Sarton, in a recent medical history lecture in Baltimore remarked, "Discoveries are important, personalities are infinitely more so." If you believe that, recall, when you go to Jamestown (the cradle of the nation and the first capital of the colony) the name of John Pott, M.D., governor from 1629-1630. He was one of Virginia's three governors chosen from the ranks of the medical profession. He was a resident and large property owner in Jamestown. Those were stormy times and Pott's reputation was assailed by his enemies, who finally brought him into court on no greater charge than that he had killed his neighbor's hogs for trespassing.

When you are at Westover it is worth remembering that the medical-minded layman, William Byrd, II, the master of this most beautiful of Virginia's river plantations, was admitted to the Royal Society in London for a medical paper entitled "An Account of a negro boy that is dappled in several places of his body with white spots." He intensely distrusted doctors, probably, because he knew more medicine than most of them. His secret diary, which has just been published, is replete with medical items of interest.

At Monticello, recall Jefferson's contributions to medicine—his interest in botany and fossils, and the fact that with Waterhouse he introduced Jennerian vaccination into America.

When you are at Mount Vernon, it will not be easy to forget the death bed scene of Washington, or Drs. Craik, Dick and Brown, the midnight consultants, who rushed to the dying father of his country, and then had to spend their remaining years trying to live down unmerited opprobrium for supposedly bleeding him to death. When you return to Alexandria (as no doubt you will on leaving Mount Vernon), you may like to look up the home of Dr. Elisha Dick on the south side of Queen's Street. In Alexandria also lived Dr. James Craik. There is a granite monument to him in the city and a tablet in the graveyard of the old Presbyterian Meeting House on South Fairfax Street. Dr. Gustavus Brown lived at Rose Hill in Maryland and had the further distinction of being the brother of nine sisters who became the mothers of one-half the population of Virginia, some say.

Speaking of monuments to doctors, you will not wish to miss the imposing statue of General Hugh Mercer in Fredericksburg, or the pensive bronze seated figure of Hunter McGuire in the capital square here. It is only a short pilgrimage to the birth place of Walter Reed in Gloucester County. The Medical Society of Virginia has restored and maintains the little two room frame house in which was born the discoverer of the method of transmission of yellow fever. It is a shrine most of us have visited in humility and reverence.

Returning to Richmond, as you walk the streets, you will encounter two, Adams and Foushee, that are named for two of our mayors who were physicians. Our graveyards, old St. John's, Shockoe and Hollywood, contain many noble monuments to the physicians who have lived among us. Particularly impressive are the monuments to Dr. James McClurg in St. John's and to Dr. William

Foushee in Shockoe, and the towering shaft to Dr. John Dove in Hollywood. As you stand and admire the White House of the Confederacy (our near neighbor), you might like to know that it was built by a physician, Dr. John Brockenborough. Apparently, doctors in those days occasionally made enough money to live at least as well as their neighbors.

IV

Perhaps the War Between the States interests you. Richmond, as you know, was the capital of the Confederacy, and naturally much remains here to remind us of those tragic days. I expect we think of them far too much, but no American record would be complete without them. As you might suspect, Richmond was the medical center of the Confederacy. More Confederate soldiers were wounded in Virginia and more wounds and diseases were taken care of here than in any other Southern state. Richmond bore the brunt of the hospital load. Here during the course of the war, no less than twenty hospitals were set up. One of them, the Chimborazo Hospital (the site of which was recently marked by an appropriate tablet), was up to that time the largest hospital the world had known. It was constructed like a cantonment and consisted of 150 single story wooden buildings, each 100 by 30 feet, located on a commanding eminence overlooking the James River. Soon after its completion, 6,000 soldiers were admitted at one time, and during the course of the war more than 77,000 patients were cared for in its various wards and "Sibley tents." Its commanding officer was James B. McCaw, a physician of Richmond and a professor in the Medical College of Virginia. The college, by the way, was at this time still housed in the Egyptian Building, and was graduating two classes of doctors a year. It was the only Southern medical school which did not close its doors during the war.

One of the earliest war hospitals to be operated in Richmond was known as General Hospital No. 1. If you will drive out Second Street to what is now known as the City Home you will see the original structure.

The offices of the Medical Department of the Confederacy were scattered about downtown Richmond. Surgeon General Samuel P. Moore's headquarters were on Ninth Street. His magnificent work of organizing out of nothing the medical service of the Confederate Army has never been properly acclaimed. He lived and died at the corner of Jefferson and Grace Streets. There, a marker informs the passerby of these events. The Medical Director's office was at Broad and Capital Streets. The Medical Inspector's office was at Main and Eleventh Streets.

V

Should you be interested in books by Virginia doctors, I point you to the writings of Eighteenth Century John Mitchell on subjects medical, botanical, chemical, historical and political; to Mark Catesby's *Natural History;* to John Clayton's *Flora Virginica;* or to that interesting group of essays and pamphlets by John Tennant, advocate of snake root in pleurisy and peripneumonia; to the first American Pharmacopoeia by Surgeon General William Brown of the

Revolutionary Army; to the works of the laymen, William Byrd of Westover and Thomas Jefferson of Monticello, who both wrote pointedly about medicine and allied subjects; to the writings of Robley Dunglison, John Esten Cooke, James L. Cabell, James Bolton, John Galt, David Tucker, Peter Mettauer, John W. Draper, William H. Taylor and Hunter McGuire, and, finally, to the works of G. R. B. Horner, Nathan Chapman, Ephraim McDowell and Walter Reed, all born and bred in Virginia, although their subsequent reputations, it is true, were made in other states.

Several important repositories of the writings of these Virginians merit your attention; notably the Library of the University of Virginia in Charlottesville, the Virginia State Library, and the Libraries of the Medical College of Virginia and the Richmond Academy of Medicine.

Those of you with antiquarian instincts will want to allow a little extra time for the inspection of the Miller Collection in the Richmond Academy of Medicine. You will find in it a large assemblage of portraits and prints of physicians (nearly 4,000 in all), autographed letters of notable doctors and many old books, among them eight incunabula; the second edition of Vesalius' Anatomy (rich in interesting book plates of former owners); the 1499 edition of Guy de Chauliac's *Surgery;* a 1573 edition of Paracelsus's *Chirurgia Magna et Minor* with pages blotted out by the hot irons of the censors of the Inquisition; the exceedingly rare first edition of Pare's Works; one of the four known copies of Carbon's *Libro del Arte,* the only known copy of Pratis's *De Pariente et Partu* in America; and the rare first English edition of Harvey's *Anatomical Exercitations,* as well as many other collector items.

Do not leave the Library before seeing the Academy's unique collection of medical silhouettes, seventy-eight in all. Special interest attaches in our minds to those of Virginia physicians, and to those cut by the great silhouette artists, Charles W. Peale, William H. Brown and Augustin Edouart.

VI

The visitor who is impressed with the new hospital of the Medical College of Virginia and sees in it more than just the tallest hospital in the South, will be interested to know that there are several other landmarks of national hospital progress to be found in this state. A little below Richmond, on the James River, at a place called Dutch Gap, there was planted one of the first English settlements. The town was known as Henricopolis. It was, unfortunately, wiped out in the Indian massacre of 1622, but not before the first hospital (in what is now continental United States) had begun to be erected there.

The first institution in this country devoted exclusively to the care of the insane was erected in Williamsburg, in 1773. (It is true that before this time the Pennsylvania Hospital made some provision for the care of the insane.) The present Eastern State Hospital, one of Virginia's four large institutions for mental cases, is the expansion of that early beginning. The House of John Galt, the first Keeper, which survived the fire of 1885, has now been moved from the grounds to the Duke of Gloucester Street by the Williamsburg Restoration.

Virginia was the first state to provide institutional care for the negro insane. The present Central State Hospital for insane negroes at Petersburg was formerly located just outside the city of Richmond on the Mechanicsville Turnpike, and moved to its present location in 1885, but free negroes were admitted to the Williamsburg asylum as early as 1774, and a separate building for negro patients was erected there in 1850.

The oldest naval hospital in the United States (the Norfolk Naval Hospital), established in 1830, is still in operation and doing good work. Captain Richard C. Holcomb's book *A Century with the Norfolk Naval Hospital* tells the story of this old institution.

May I close with a few Virginia medical priorities? Most of them are the natural consequences of the fact that English colonization had its beginning here: (I realize that priorities are popular chiefly with those who make the claims and have been somewhat discredited of late.)

1. The first English physician to land on American shores: Henry Kenton; Eastern Shore of Virginia, 1603.
2. The first attempt at hospital construction in continental United States: Henricopolis, 1620.
3. The first insane asylum in this country: Williamsburg, 1773.
4. The first separate institutional care of negro insane: Richmond, at Howard's Grove, 1869.
5. The first naval hospital: Norfolk, 1830.
6. The first American Caesarean section and oophorectomy: Jesse Bennett, 1794.
7. The first successful operation for vesicovaginal fistula: John Peter Mettauer, 1827.
8. The first American autopsy: Jamestown, 1624.
9. The first use of steam in the disinfection of ships: Agrippa Bell, 1848.
10. The first American Pharmacopoeia: William Brown, 1778.
11. The first medical practice act in this country: Jamestown, 1639.
12. The first American college to teach comparative anatomy: University of Virginia.
13. The first ten months' course in medical teaching: University of Virginia, 1832.
14. The first to discover the method of the transmission of yellow fever: Walter Reed, 1900.

And now I leave you, I am afraid, as one is usually left at the end of a sight seeing tour, tired and somewhat confused, but possessed, I trust, with enough of that wealth which is demanded of every traveller to the Indies if he would carry home treasure from the Indies.

JOURNAL
OF THE
Association *of* American Medical Colleges

Volume 17 MAY, 1942 Number 3

Acceleration of Medical Course

A poll of the member medical colleges in the United States taken to determine how many will accelerate the course of study by elimination of long vacations disclosed almost unanimity of action. Only five colleges will not accelerate. One of the five is waiting for action by its state legislature whose consent must be secured before acceleration is possible. This is the State of Oklahoma. The remaining four colleges are: Meharry, Howard, Baylor and Kansas. Kansas, however, has a program which makes it possible for a junior student to enter on his senior studies immediately after the close of the third year and graduate in February. From 11 to 18 students have been doing that. The remainder of the class—about 70 students—continues in the usual manner and graduates in June.

In the case of a few schools, acceleration will affect the upper three classes only. Freshmen will not be accelerated, at least not this year. They will enter on their studies in September or October. The next course of study in those schools which will go on complete acceleration (66) will begin in May (2 schools), June (37 schools), July (27 schools).

Seventy-two schools will go on complete or partial acceleration. The duration of the academic year will be as follows: 8 months, 4 schools; 8½ months, 3 schools; 9 months, 26 schools; 32 weeks, 16 schools; 33 weeks, 10 schools; 34 weeks, 3 schools; 35 weeks, 1 school; 36 weeks, 9 schools; 3 quarters, 1 school.

Fifteen of the accelerating schools will admit once a year; 56 schools will admit every nine months—at the end of each academic year; one school has not decided what it will do—but it will probably admit once a year.

Twenty-one schools will go on the semester plan; 14 on the trimester plan; 33 on the quarter plan; one school will use the trimester plan for first and second year students and the quarter plan for third and fourth year students; one school makes use of all plans in different years; 2 schools have not decided which plan will be followed.

Twenty-three schools will increase the freshman class by a total of 137 students; 49 schools will not admit any more students than they did for the 1942 freshman class.

◆ ◆

The Welch Fellowships

Some fifteen or twenty years ago a number of chairs in medicine were filled by the appointment of men of about the same age group. This means that eight or ten years hence the professors of medicine in eleven out of thirteen of the leading medical schools will begin to retire on account of age; and illness or accident may hasten the process. If present and predictable limitations in all schools continue for another decade, convenience rather than quality will determine the choice of selection of the most important posts in American medicine.

In 1941, The Rockefeller Foundation took a step which represents an attack on this particular angle of the many-sided problem. An appropriation of $168,000 was made to the National Research Council in support of a plan of senior fellowships in internal medicine, offering long training and adequate stipends to carefully selected men from thirty to forty years of age. These fellowships, named in honor of a wise and beloved leader in American medicine, will be known as the Welch Fellowships, and in tenure and terms of appointment

will resemble the Cambridge Trinity College Fellowships and the Beit Fellowships in Great Britain. Stipends will be adjusted to the locality and the needs of the holder, but will not exceed $6,000 annually; in addition, allowances not to exceed $1,000 a year will be made for equipment and technical assistance. The first appointment will be for a period of three years, and subsequent appointment will be at the discretion of the Council up to a total term of six years for each fellow. Fellowship holders will be free to move to the clinics best equipped to train them. They will have clinical and teaching experience as well as opportunities for research, and will thus receive a type of training appropriate for future teaching posts.

Since 1922 the Foundation has contributed over $700,000 to the National Research Council for fellowships in the clinical and preclinical branches of medicine. The recipients of these fellowships, however, have been men younger and less mature than those who will be eligible for the proposed Welch Fellowships. Furthermore, of the 279 fellows appointed between 1922 and 1941, the majority served for only one year, and very few for more than two years. Valuable as these junior fellowships have been, they have not touched the more serious weakness in the system of recruitment and selection of professors.

If these Welch Fellowships succeed in their purpose of training men of real scientific stature and at the same time meet in some measure the serious needs of the future, the Foundation would expect to make further grants along this line.

◆ ◆

Hospitals and Accelerated Program of the Medical Colleges

Beginning April 1, classes of interns will be graduated about every three months under the accelerated program of the Medical Colleges. During the coming year the selection and maintenance of interns will present a difficult problem which the hospitals will have to solve. With the program in full swing and the interns appointed for a full year of service, the hospitals will find that services overlap from three to four months. During this period they will have to provide living accommodations and a satisfactory distribution of service for twice the number of interns needed or allotted.

It has been appropriately suggested that as no provision has been made for residents or assistant residents, the senior interns, those who have served eight or nine months of their year, may for the remainder of their service act as residents or assistant residents and supervisors of the new intern group.

While this may be difficult to arrange, it gives evidence of a satisfactory solution to a difficult problem, leaving the provision of accommodations the only obstacle to be considered.

Hospitals will be able to adjust their intern training problems to the Medical Colleges' accelerated program without great difficulty after the first two or three classes are graduated. The program will impose an added interest and effort on the part of staff-members in the process of intern education. This is as it should be, and in itself will present no difficulty. It should mean and probably will result in a more intensive and certainly more valuable year for every intern from an educational standpoint.

Under the arrangement hospitals are assured of a full year of service for each intern appointed. The change-over from the present system can be made without confusion and with a minimum disarrangement of service. The hospitals will cooperate fully and willingly, and certainly to the advantage of both the intern and the institutions. *Hospitals:* Edit. 16:67 (Apr.), 1942.

◆ ◆

H. G. Weiskotten

Dr. H. G. Weiskotten, dean and professor of pathology, College of Medicine, Syracuse University, has been appointed secretary of the Council on Medical Education and Hospitals of the American Medical Association to succeed the late Dr. William D. Cutter.

College News

Long Island
College of Medicine

A Symposium on Psychosomatic medicine was held, under the auspices of the College at the Hoagland Laboratory, March 26, 1942. The speakers included: "The Patient as a Person," G. Canby Robinson, Lecturer in Medicine and Preventive Medicine, Johns Hopkins University School of Medicine; "The Qualitative Identity of Bodily Changes Induced by Psychogenic and Organic Processes," Russell Meyers, Instructor in Physiology and Pharmacology (assigned to Neurology and Psychology); "Somatic Disorders as Expressions of Personality Problems," George Draper, Associate Professor of Clinical Medicine, College of Physicians and Surgeons, Columbia University; "Observations on Experimental Investigations in Psychosomatic Medicine," Bela Mittelmann, Neurology and Psychiatry, O.P.D., Post-Graduate Hospital, New York, N. Y.; "The Role of Psychiatry in Clinical Medicine," George E. Daniels, Clinical Professor of Psychiatry, College of Physicians and Surgeons, Columbia University; "Interrelation of Mind and Body," Foster Kennedy, Physician-in-Charge of Neurology, Bellevue Hospital.

The Long Island College of Medicine is introducing an old idea in a new form through a series of visiting professorships, financed by a grant from the Commonwealth Fund of $4,500 a year for three years. Proceeding on the concept that all departmental heads have phases of their teaching program they would like to strengthen, the College is inviting scholars from other institutions for short periods to make specific contributions to the curriculum.

Dr. Thomas Addis, of Stanford University School of Medicine, joined the Long Island faculty March 16th, as the initial visitor under the new plan. He will remain for six weeks as the guest of Dr. Tasker Howard, professor of medicine.

Because of war conditions, with their drain on our faculties, there will be need for great flexibility in the efficient use of available teaching resources. Though war conditions may make the application of the visiting professorship plan more difficult, the opportunity for a selective strengthening of a medical faculty is especially inviting at a time when budgets lag behind the rapidly growing demands made on them. Not all of the benefits should accrue to the host institution, for, if the plan justifies itself, it is to be hoped that it may be extended to other schools as well.

The Research Society of the Long Island College of Medicine held a meeting the evening of April 8, 1942. The program was as follows: "Quantitative Study of Plasma and Extracellular Fluid Volume Changes in Some Instances of Dehydration," Victor Rudomanski, Department of Pediatrics; "A Comparative Study of the Complement-Fixation and Flocculation Tests in the Diagnosis of Syphilis," Louis C. Johnson, Department of Medicine, and "A Practical Technique and Design for the Assay of Digitalis on the Embryonic Chick Heart," George H. Paff and Robert A. Lehman, Department of Anatomy and the Department of Therapeutics, New York University Medical School.

Mr. Alfred R. Crawford has been appointed assistant to the dean.

An arrangement has been made with Cornell University Medical College through Dr. Wilson G. Smillie, professor of public health and preventive medicine, by which he and four members of his department are giving the spring course in parasitology at the college. The arrangement is made possible through the recent grant of The Commonwealth Fund for visiting professorships.

As a further development of the work in tropical medicine at the Long Island College of Medicine, Dr. Elberton Tiffany, assistant professor of bacteriology, is now at Tulane University in New Orleans, where he is taking further training in parasitology and tropical medicine on a Commonwealth Fund fellowship.

March 29, 1942, marked the 82nd anniversary of the first lecture to medical students at the Long Island College Hospital. Since that time, over 7,000 students have been taught in its amphitheatre, at the bedside, and in its outpatient department in the Polhemus Memorial Clinic.

At present, students receive their first taste of "real" medicine in the College Hospital amphitheatre at the very beginning of the freshman year. While studying such laboratory subjects as anatomy, biochemistry, and physiology, they meet once a week to observe patients presenting problems that come under these categories.

These "correlation clinics" are continued during the second year in connection with such basic courses as bacteriology and pharmacology. In this way, the Hospital lives up to its historical ideal of bringing the students, at every step of their progress, into close contact with problems of the whole patient.

As juniors, the medical students work in the dispensary clinics, learning about the diagnosis and treatment of patients with general medical, surgical, eye, nose, throat, skin, and kidney disorders. Since these patients are all ambulatory, the experience here obtained closely approximates that of the doctor's office practice. These young "doctors in the making" learn, under supervision, the pertinent points of medical history, carry out the steps of examination, and apply the indicated treatment. Under the direction of the department of Preventive Medicine and medical social service the students follow their patients into their homes to observe the effects of environmental conditions on health.

When the fourth year rolls around, the Long Island College Hospital accepts its quota of senior clerks who aid with the diagnostic studies and care of the bed patients on its wards. In surgery, the clerks follow their cases to the operating amphitheatre where they are initiated into the mysteries of "scrubbing up" and assisting.

In obstetrics, they are guided in the meticulous technique required for safe prenatal and delivery-room care of patients during pregnancy and childbirth. They learn about prematures, the young infant, and the growing child. The whole program is tied together by a discussion of the general medical problems of youth, adulthood and old age.

* *

University of Cincinnati
College of Medicine

More than $30,000 in gifts for research were accepted at the March meeting of the Board of the University of Cincinnati. Among these gifts were $9,500 from an anonymous donor for the Heart Station Fund in the Department of Internal Medicine; $3,500 from an anonymous donor to the Porter Fund in Obstetrics; $2,400 from the National Advisory Cancer Council to the Department of Surgery "to improve the present method of diagnosis and treatment of cancer;" $1,200 from the Lederle Laboratories, Inc., to the Department of Biological Chemistry; and $1,500 from an anonymous donor to the Craig Yeiser Fund in the Department of Preventive Medicine.

A total of $12,500 has been contributed to support the work carried out under the auspices of the College of Medicine in the field of nutrition. Of this total, $4,000 was contributed by E. R. Squibb and Sons; $4,000 by Eli Lilly and Company; $4,000 by Mead Johnson and Company; and $500 from the Martha Leland Memorial Fund.

It was also announced that the Board of Directors had entered into a contract with the government by which up to $47,290 will be paid through the Office of Scientific Research Development to

support two experimental studies, the first, dealing with the scientific and bacteriological investigation of contaminated wounds and their treatment with the newer chemotherapeutic agents to be conducted by the Department of Surgery; the second, a study of certain problems of the physiology of high altitude flying, to be conducted by the Department of Medicine and the Kettering Laboratory of Applied Physiology.

Dr. Alexander A. Weech, associate professor of pediatrics, Columbia University College of Physicians and Surgeons, New York, has been appointed professor of pediatrics to succeed the late Dr. Albert Graeme Mitchell. Dr. Weech graduated at Johns Hopkins University School of Medicine in 1921, subsequently serving for some years on the faculty. From 1928 to 1930 he was in charge of the division of pediatrics at Peiping Union Medical College, Peking, China.

Dr. Harry L. Claassen, assistant professor of dermatology and syphilology has been promoted to professor. He fills the vacancy caused by the death of Dr. Elmore B. Tauber, Jan. 23, 1941. Dr. Claassen has been assistant professor and acting head of the department. With his promotion Dr. Claassen also became director of the service of dermatology and syphilology in the Cincinnati General Hospital.

• •

Yale University
School of Medicine

George R. Cowgill, associate professor of physiological chemistry at Yale University and editor of the Journal of Nutrition, was awarded the $1,000 Mead Johnson and Company prize by the American Institute of Nutrition for researches dealing with the B complex vitamins.

This prize is given annually to the research worker in the United States or Canada who, in the opinion of a committee of judges from the American Institute of Nutrition, has published the most meritorious work dealing with the field of the B complex vitamins or who has made valuable contributions over an extended period of time.

Dr. Stanhope Bayne-Jones, professor of bacteriology, was called to active duty in the Surgeon General's Office at Washington, D. C. Dr. Bayne-Jones holds the commission, Lieutenant Colonel.

The Carnegie Corporation of New York has given a grant of $10,000 to support a research program at the Clinic of Child Development. The clinic, which was founded in 1911 by Dr. Arnold L. Gesell, its present director, is investigating the mental growth of normal infants and devising clinical methods for the early diagnosis of developmental defects and deviations. Staffed by pediatricians and psychologists, it maintains a diagnostic and advisory service for infants and preschool children, a guidance nursery, a photographic research library and special facilities for one way vision observation and for systemic studies of normal and abnormal child behavior.

Ralph G. Meader, Ph.D., assistant professor of anatomy, Yale University School of Medicine, New Haven, has been appointed assistant to the director of the Jane Coffin Childs Memorial Fund for Medical Research at Yale and will supervise the fund's activities during the absence of Lieut. Col. Stanhope Bayne-Jones, director, who has reported for duty in the Office of the Surgeon General, Washington, D. C. The Childs Memorial Fund was established at Yale in 1937 and is primarily concerned with cancer research.

• •

Louisiana State University
School of Medicine

Commencement exercises for the 84 members of the graduating class of the Louisiana State University School of Medicine were held at the Municipal Auditorium in New Orleans at 8 p.m. on February 18th. This class would ordinarily have graduated in June, but, because of the national emergency, began its final year's work on June 16, 1941, in order to comply with the request of the Association of American

Medical Colleges that its preparation for medical military service be hastened. This is one of the first classes, if not the first class, in medicine to graduate in the country and complete its work under the accelerated program. Practically all its members who are eligible for a commission with the armed forces have applied for or have received such commission, and, after a year's internship, will automatically enter active service in the Army or Navy Medical Corps. Of the 80 members of the senior class who are eligible for commission in the Army, Navy or U. S. Public Health Service, 81 per cent have applied for a commission. Dr. C. S. Boucher, Chancellor of the University of Nebraska, was the commencement speaker.

◆ ◆

University of Toronto
Faculty of Medicine

An institute of physiology will be established under the direction of Dr. Charles H. Best, professor of physiology and head of the department. Two new subdepartments have been organized in the School of Hygiene; namely, public health administration and nutrition.

The following medals, prizes, fellowships, scholarships and bursaries were awarded March, 1942: The Faculty Gold Medals, J. G. Mickler and W. Wise (Aeq); The Ellen Mickle Fellowship, W. Wise; The Chappell Prize in Clinical Medicine, M. W. Johnston; The William John Hendry Memorial Scholarship in Obstetrics and Gynecology, J. W. Rogers; The Ontario Medical Association Prize in Hygiene and Preventive Medicine, V. Hertzman; The David Dunlap Memorial Scholarship, J. W. Rogers; The David Dunlap Memorial Scholarship (Fifth Year), D. W. Best; The Ronald S. Saddington Medal in Pathology, H. Goldenberg; The John Copp Bursary, H. A. MacMillan.

◆ ◆

University of Georgia
School of Medicine

Two grants for investigation in two of the departments are announced. One is a grant in aid of $4,350 for continuation of researches in the newer venereal diseases under the direction of Dr. Robert B. Greenblatt, head of the department of experimental medicine. The other award of $2,000, from a donor to be unnamed for the present, is for the continuation of researches in nutrition by Dr. V. P. Sydenstricker, professor of medicine, and his staff.

Recent speakers before the faculty and student body were Dr. J. Dellinger Barney, of Boston, who spoke on "A Consideration of Some of the Problems of Renal Stones," and Dr. L. Clarence Cohn, of Baltimore, whose subject was "Carcinoma of the Female Breast."

To succeed Dr. R. Frank Slaughter as full time head of the department of neurologic surgery, Dr. Wilford Arless Risteen, of Rochester, New York, has been selected. Dr. Risteen took over his duties March 1, 1942.

The former Wilhenford Hospital for Women and Children has been converted into a Tuberculosis Hospital and was occupied on February 1. The capacity of the hospital will be sixty beds. It is in charge of Dr. Lucius N. Todd, professor of tuberculosis.

◆ ◆

Harvard Medical School

Many scholarships and fellowships are available which may be granted to students under certain conditions and which will help them to pay at least a portion of their expenses. The school also offers to incoming members of the first year class two or three national scholarships which carry a stipend large enough, if necessary, to meet all the student's essential expenses; successful applicants who maintain a high honor record will continue to hold these scholarships through the medical course. Direct application for the national scholarships cannot be made, since all accepted first year students are considered as candidates, the awards being made without reference to financial circumstances.

Loan funds have been established to which second, third and fourth year

students in need of financial assistance may apply for loans up to $400 during any one year and to a total of $1,000 during the course. The notes are payable two years after graduation; 5 per cent interest is charged. Such loans are made only to students whose records have been sufficiently creditable to make it probable that they will remain in the school and whose other financial obligations do not make it improbable that this loan will be repaid.

The tutorial system at Harvard Medical School makes it possible for properly qualified students to do extra-curricular work throughout their course. Students who because of previous training have a special interest in the medical sciences are encouraged to devote the spare time afforded by the two free afternoons to intensive work on a well defined problem. Not more than 15 per cent of the class is allowed this privilege, and their past records must show that their regular curricular work will not be impaired if they undertake such extra-curricular studies.

◆ ◆

Woman's Medical College of Pennsylvania

Dr. Martha Tracy, Assistant Director of the Department of Public Health of Philadelphia, died of pneumonia on Sunday, March 22nd, in the Hospital of the Woman's Medical College. Dr. Tracy graduated from Woman's Medical College in 1904, and was Dean for 22 years, until her retirement in June, 1940.

Dr. T. Ruth Hartley-Weaver has been appointed Assistant Director of the Department of Public Health of Philadelphia, succeeding Dr. Martha Tracy. Dr. Hartley-Weaver graduated from the Woman's Medical College of Pennsylvania in 1917, and in recent years has been Registrar of the Division of Vital Statistics of the Department of Public Health of Philadelphia.

The Woman's Medical College of Pennsylvania announces the publication of a News Letter, the first issue of which was sent out in February and the second to be mailed in April. The Letter is sent to Alumnae and other interested individuals and groups to keep them up-to-date on the affairs of the institution. The Editors are Mrs. Curtis Bok, Chairman of Public Relations, and Dr. Margaret D. Craighill, Dean, and the Business Manager, Miss May Herrmann, Assistant to the Dean. Anyone who desires to be placed on the mailing list to receive this publication periodically, should notify the Assistant to the Dean at the College.

◆ ◆

New York University College of Medicine

The fifth series of the John Wyckoff Lectures was delivered by Dr. Richard P. Strong, professor emeritus of tropical medicine at the Harvard Medical School, March 24 and 25, 1942. The subject of Dr. Strong's lectures was: "Tropical Diseases and the War." First Lecture: "Dysentery, Typhus Fever, and Plague." Second Lecture: "Trypanosomiasis and Onchocerciasis."

These lectures were established by the Phi Delta Epsilon Fraternity in 1937 in memory of the late Dean John Wyckoff.

The annual Christian A. Herter Lectures at the New York University College of Medicine were delivered by Dr. Conrad A. Elvehjem, professor of biochemistry at the University of Wisconsin, on April 6 and 7, 1942.

The topics of these lectures were "Recent advances in our knowledge of the components of the Vitamin B Complex" and "The relation of the B Vitamins to intermediate metabolism."

◆ ◆

University of Minnesota Medical School

Recent gifts: $7,000 from the Citizens' Aid Society to support research on gastric ulcer under Dr. Owen H. Wangensteen, professor and head of the department of surgery at the medical school, to be used over a two year period; $4,700 from the National Research Council for research on fat metabolism;

$2,500 from the National Confectioners Association for use by Ancel Keys, Ph.D., professor of physiology, in his study on diet and fatigue; $2,000 from the John and Mary R. Markle Foundation, New York, as a supplementary grant to support the work of Dr. Albert V. Stoesser, associate professor of pediatrics, on water-electrolyte metabolism in intractable asthma; $1,200 from the W. H. Barber Company for the Ivar Sivertsen Foundation for cancer research, and $1,000 from an anonymous donor through the Minnesota Medical Foundation to establish a research problem in the division of internal medicine.

◆ ◆

Emory University
School of Medicine

The eye pathological laboratory of Grady Hospital was formally opened February 12th. This laboratory was made possible through the generosity of Mr. L. F. Montgomery. Its facilities are open to all ophthalmologists of the state of Georgia.

◆ ◆

University of Rochester
School of Medicine

Dr. Henrik Dam, formerly professor of biochemistry at the Polytechnic Institute, Copenhagen, Denmark, will carry on research in the departments of anatomy, biochemistry and pediatrics. Dr. Dam has studied at the University of Graz, Austria; held a Rockefeller Fellowship at the Institute of Pathology, Freiburg, Germany; and worked with P. Karrer at the University of Zurich, Switzerland. Dr. Dam's research is mainly in the field of sterol biochemistry and vitamins. He discovered vitamin K and investigated the various biochemical and clinical problems in connection with it. More recently his work has been concentrated on certain aspects of vitamin E deficiency.

A unit under Dr. George P. Berry's direction has been organized in the department of bacteriology to carry on research for the Navy in the field of infectious disease. The group is part of a larger unit with headquarters at the Rockefeller Institute for Medical Research in New York City under the direction of Commander Thomas M. Rivers. It is planned that the Rochester group will be concerned particularly with filterable viruses and that most of the research work will be done in the laboratories of the Medical School. The following personnel has been commissioned in the U. S. Naval Reserve: Lieutenant Commander George Packer Berry, Lieutenants John A. Lichty, Jr., Oliver R. McCoy and Jerome T. Syverton and Lieutenant (j. g.) Chris P. Katsampes. Doctors William L. Bradford, Edward P. Offutt, Henry W. Scherp and Howard B. Slavin will be associated with the research as civilian participants.

◆ ◆

Stanford University
School of Medicine

The sixtieth course of Popular Medical Lectures was begun on April 3 and continued on April 17. The two final lectures for the year will be given May 1 and 15, 1942. The subjects of these lectures and the lecturers were as follows: April 1: "The Blood Bank; Its Purpose and Uses in Wartime," by Dr. John R. Upton; April 17: "Medical Aspects of Civilian Defense," by Dr. Anthony J. J. Rourke; May 1: "Alcohol in Relation to Driving Hazards," by Dr. Henry W. Newman; May 15: "Control of Venereal Disease Under War Conditions," by Dr. Charles W. Barnett. These lectures are free and open to any one interested in them.

◆ ◆

University of Kansas
School of Medicine

Although Kansas has not adopted the full accelerated program of instruction as many other medical colleges have done, nevertheless it gives opportunity for some speeding up to students who choose to do so and who will graduate in September instead of the following June. Each year from 12 to 18 students do this. About 70 students graduate annually in June.

Washington University
School of Medicine

The seventh Leo Loeb Lecture under the annual lectureship established by the Mu Chapter of the Phi Beta Pi Medical Fraternity was delivered by Dr. John Herr Musser, professor of medicine at Tulane University, on March 23. The subject of Dr. Musser's address was, "The Heart that Is Getting Old." The second Robert J. Terry Lecture of the Washington University Medical Alumni Foundation was delivered by Dr. George Bernays Wislocki, Parkman Professor of Anatomy at the Harvard Medical School, April 22nd. The subject of Dr. Wislocki's lecture was, "The Primate Placenta, with Particular Reference to the Trophoblast."

◆ ◆

Duke University
School of Medicine

In order to cooperate with the accelerated medical school program, the Duke Hospital internships of twelve months in the various services will commence on July 1st, 1942, April 1st, 1943, January 1st, 1944, October 1st, 1944, and July 1st, 1945. This schedule will provide an overlapping in internships for a period of three months, during which the preceding group will be senior interns. Applications should be sent to the Superintendent six months before these dates.

◆ ◆

Indiana University
School of Medicine

Dr. Frank M. Gastineau, Indianapolis, has been appointed head of the department of dermatology and syphilology succeeding Dr. Paul Cregor, who retired.

◆ ◆

New York Medical College

Dr. J. A. W. Hetrick, acting dean since March, 1941, has been appointed dean.

University of Texas
School of Medicine

Dr. Harvey C. Slocum, instructor in anesthesia at the University of Wisconsin Medical School, has been appointed professor of anesthesia and director of the department of anesthesia.

◆ ◆

Georgetown University
School of Medicine

Michael X. Sullivan, Ph.D., since 1931 director of the Chemo-Medical Research Institute, was presented with the Hillebrand Award of the Chemical Society of Washington for his work on the "Sulfur-Containing Substances of the Body."

◆ ◆

Cornell University
Medical College

At the request of the Navy, a practical review course in tropical medicine and parasitology is being given at the College for naval medical officers. Lectures, laboratory work, and clinical demonstrations cover four hours daily for one month. Staff members who may be called for tropical service also are taking the course.

The lectures include a distinguished group of doctors, all of whom have had long experience in tropical medicine.

◆ ◆

University of Michigan
Medical School

Dr. Maurice H. Seevers, associate professor of pharmacology, University of Wisconsin Medical School, has been appointed professor of pharmacology and chairman of the department.

◆ ◆

University of Southern California
School of Medicine

Dr. Seeley G. Mudd, has been appointed dean to succeed the late Dr. Paul S. McKibben.

Meharry Medical College

Dr. Walter Henry Maddux, now completing graduate studies at Yale University School of Medicine, New Haven, has been appointed professor of pediatrics.

◆ ◆

Johns Hopkins University School of Medicine

Dr. Hugh H. Young, professor of urology, and director of the Brady Urological Institute of Johns Hopkins Hospital, Baltimore, will retire at the end of the present academic year, June 30, with the title professor emeritus of urology.

◆ ◆

University of Wisconsin Medical School

A lecture on "Hints in Handling the Nervous Patient" was delivered March 6th by Dr. Walter C. Alvarez under the sponsorship of Nu Sigma Nu Medical Fraternity. Drs. E. L. Sevringhaus, professor of medicine, Carl N. Neupert, assistant state health officer and Clair O. Vingom, chairman of the Health and Welfare Section of the Dane County Council on Defense participated in a program on nutrition, March 19 and 20.

◆ ◆

Western Reserve University School of Medicine

Dr. Charles T. Dolezal, assistant clinical professor of medicine, has been appointed welfare director of Cleveland.

◆ ◆

University of Oklahoma School of Medicine

Beginning with the second semester of the present scholastic year, an obligatory course in first aid for all seniors was inaugurated. The school also arranged for an elective course in tropical medicine open to seniors and juniors.

Tulane University of Louisiana School of Medicine

Dr. Hiram W. Kostmayer, professor of clinical gynecology and director of the department of graduate medicine has been appointed acting dean during the absence of Dr. Maxwell E. Lapham, who has been assigned to special duty in the Bureau of Medicine and Surgery, U. S. Navy.

◆ ◆

Columbia University College of Physicians and Surgeons

All students are taking the American Red Cross standard first aid course so that they may be prepared to be of service during an air raid and to participate in instruction of lay groups. Members of the senior class have been organized to assume definite responsibilities at the Columbia-Presbyterian Medical Center during an emergency. These students will work in cooperation with the Catastrophe Unit of the Medical Center.

◆ ◆

University of Western Ontario Faculty of Medicine

A chapter of Alpha Omega Alpha, the honor medical society, was installed as Beta Chapter of Ontario recently. The charter was conferred by Dr. Walter L. Bierring, national president of the society and the installation was made by Dr. Louis B. Wilson, director emeritus of the Mayo Foundation. The charter was accepted by Dean Campbell of the college faculty.

◆ ◆

Vanderbilt University School of Medicine

Vanderbilt will accelerate. The next session will begin June 12th, will be conducted on the trimester system, and will end March 22, 1943. The freshman class for 1943 will begin work March 26, and the first trimester will end June 4.

Northwestern University
Medical School

In the will of the late Dr. Joseph B. De Lee bequests provide for establishment of the Joseph Bolivar De Lee Endowment for Medical Education and a foundation bearing his name for teaching and research of Northwestern University Medical School and its clinics. The first was provided for with annuity funds of $10,000 arranged for in 1923 to take effect on his death and the second fund of $100,000 was created in 1929.

◆ ◆

University of Maryland
School of Medicine

The Trustees of the International Cancer Research Foundation of Philadelphia have awarded to the Department of Pharmacology $3,500 for continuing work which has been in progress here on the "Chemotherapy of Walker Sarcoma 319." This is the fourth grant awarded to this department by the Foundation.

The Ohio Chemical and Manufacturing Co. of Cleveland, Ohio, has awarded to the Department of Pharmacology $3,500 to continue researches which are in progress on volatile anesthetics. This is the fifth grant awarded this department by the Ohio Chemical and Manufacturing Co.

◆ ◆

Temple University
School of Medicine

Temple will accelerate. The sophomore, junior and senior classes will begin work July 1 and finish March 15, 1943. The next freshman class will begin work August 17, 1942 and finish the middle of April, 1943. The 1943 freshman class will be admitted June 1, 1943. The semester plan of instruction will be used.

◆ ◆

General News

Charles Taylor Reeves Foundation

The University of California recently opened a new laboratory to be used for pathology and research in ophthalmology, to be jointly directed by the division of ophthalmology in conjunction with the divisions of ophthalmology and pathology. Dr. Michael J. Hogan, San Francisco, has been made director of the new unit. The laboratory was made possible by a fund of $70,000 known as the Charles Taylor Reeves Foundation, the income from which is to be used in the study of diseases of the eye. Actual construction was accomplished through a donation of Mrs. E. S. Heller.

◆ ◆

Menninger Foundation

Announcement is made of the incorporation under the laws of Kansas of the Menninger Foundation, with headquarters in Topeka. The new foundation aims to provide psychiatric education, especially the training of young physicians in psychiatry, to encourage research in psychiatric and psychologic fields; to make available psychiatric treatment for patients in the low income bracket and to prevent mental illness, especially through development of child psychiatry and the application of psychiatric knowledge to education and child rearing.

Officers of the foundation are Dr. Karl A. Menninger, president; Mr. John R. Stone, vice president; Dr. William C. Menninger, secretary, and Dr. Robert P. Knight, Topeka, treasurer. Trustees are: Dr. Winfred Overholser, medical superintendent, St. Elizabeths Hospital, Washington, D. C.; Mrs. Albert Lasker, New York and Chicago; Dr. John C. Whitehorn, Baltimore; Mrs. Lucy Stearns McLaughlin, Santa Fe, N. M.; Dr. James Roscoe Miller, Chicago; Mrs. Sidney C. Borg, New York; George W. Hite Jr., New York.

Grants have been made for a ten year study of the place of occupational therapy in psychiatric treatment, for a seminar and special Bulletin on Military Psychiatry and the distribution of this information to physicians on the medical advisory boards of the country, and for research in the use of hypnosis in emergency psychotherapy and in substantiating newer psychiatric theories.

◆ ◆

Study of Rheumatic Fever

Irvington House, of Irvington-on-Hudson, New York, has received a grant of $1,000 from the Borden Company to help carry on its work in the study of heart disease. The Sanatorium, known as "The House of Mending Hearts," houses about 100 young underprivileged patients who have heart disease as a result of rheumatic fever. Special care and supervised living are provided for children afflicted with rheumatic heart disease. It is recognized as an ideal convalescent home for cardiac youngsters.

◆ ◆

Knight Memorial Education Fund

In 1940, the Beacon Journal Publishing Company of Akron, Ohio, established a fund of $25,000 to be known as the C. L. Knight Memorial Education Fund, honoring the founder of the *Journal*. The purpose of the fund is to furnish financial means and to afford opportunity to needy persons irrespective of age, sex, race, politics or religion to secure a higher education in any college or postgraduate course or special courses in art, music, literature or science in any recognized or approved university of their choice.

Any person is eligible to apply for aid from the fund who has been a resident of Summit, Medina, Portage, or Wayne County in the State of Ohio one year prior to applying for a grant. Thirty-four grants were made in 1940. The recipients attended twenty different institutions and studied in fifteen departments of instruction. A study of the

records of these students at the end of the year showed that they had done exceedingly well. One student stood second in his class in his first year in medical school. Fifteen won fellowships or scholarships. An unusual feature of this fund is that the money is an outright gift to the student. The expectation is, however, that the recipients will repay their grants when they can.

◆ ◆

Therapeutic Research Corporation of Great Britain

A group of the leading manufacturers of medicinal products of Great Britain has formed an organization for the more effective prosecution of research in their industry. No new discoveries by the Corporation will be monopolized by any one company. This combination should prove of great value in medicine and it should strengthen the growing alliance between academic workers and those in industrial firms.

◆ ◆

Licensure in California Adapted to Acceleration

The secretary of the board of medical examiners reports that the attorney general of California has advised him that he may accept for licensure applicants who have graduated from an accelerated medical course. The attorney general pointed out that the medical practice act requires that an applicant must have attended four resident courses of instruction, each consisting of not less than thirty-two weeks with a total of four thousand hours of instruction, but such courses need not be pursued continuously or consecutively. The regulation of the time, if any, elapsing between resident courses of instruction, the attorney general said, is a matter to be handled by each approved school.

◆ ◆

Public Health and Preventive Medicine

The largest appropriation made by the Rockefeller Foundation in 1941 was $600,000 toward the endowment of the Department of Public Health and Preventive Medicine of the Cornell University Medical College in New York.

In the last four years the department has been reorganized under the leadership of Dr. W. G. Smillie, formerly of Harvard, who now directs a staff of twelve associates. The teaching and research work has been substantially increased and improved. It is now coordinated with the City Department of Health, the New York Hospital, the Cornell Medical College, the Guggenheim Dental Clinic, and various social agencies and visiting nursing organization. Special studies are being made in pneumonia, in tuberculosis with assistance from The Rockefeller Foundation, in nutrition with support from the Milbank Fund and from the United States Public Health Service, and in population problems and the influence of social factors on illness, with Macy Foundation support.

◆ ◆

Dr. Willard C. Rappleye

Dr. Rappleye, since Oct. 1, 1940 commissioner of hospitals of New York City, has resigned to return to his activities as dean of Columbia University College of Physicians and Surgeons. At the time of his appointment, Dr. Rappleye was granted a fifteen months leave of absence from his deanship.

◆ ◆

Massachusetts Board of Registration in Medicine

Dr. H. Quimby Gallupe, of Waltham, Massachusetts, has been appointed secretary of the board to succeed Dr. Stephen Rushmore who resigned to accept the deanship of the School of Medicine of Middlesex University. As secretary, Dr. Gallupe also becomes chairman of the Approving Authority for Colleges and Medical Schools.

◆ ◆

Columbia University College of Physicians and Surgeons

Dr. Alwin M. Pappenheimer, professor of pathology, was the recipient of a prize of $1,000 and a bronze medal from the Eli Lilly company for his work in developing a new science combining bacteriology, chemistry, physics and nutrition in the treatment of disease.

Book News

Bacteriology

By Einar Leifson, M.D., Professor of Bacteriology, University of South Dakota School of Medicine. Paul B. Hoeber, Inc., Medical Book Department of Harper & Brothers, New York, 1942. Price, $5.

One of a series of textbooks prepared specially for the use of undergraduate students, presenting a well integrated and complete discussion of the fundamentals of the science of bacteriology together with a working description of the laboratory techniques essential to a study of the subject. This plan envisages a new approach to textbook writing. Nonessentials, which the student does not have time to cover are omitted. It is not a compendium nor an outline. It is a complete presentation of the subject of bacteriology for the medical student, not condensed but limited to what every student should and must know for the intelligent practice of medicine. The author, who is well known in this field, has done a fine piece of work; one which should easily eliminate the bugaboo of large, unwieldy and costly books which the student does not have time to read nor the funds to buy. While designed primarily for the undergraduate student, the graduate and the practitioner will find it useful for the purpose of brushing up on the subject.

◆ ◆

Medical Biochemistry

By Mark R. Everett, Ph.D., Professor of Biochemistry. University of Oklahoma School of Medicine. Paul B. Hoeber, Inc., Medical Book Department, Harper & Brothers, New York. 1942. Price, $5.75.

Another in the series of student textbooks giving complete coverage of the subject by a teacher of long experience who has for many years taught biochemistry from the standpoint of the prospective practitioner of medicine rather than the pure biochemist. The subject is presented in a manner which makes it possible for the student to follow the text in his work in the laboratory and to help to clarify in a simple way the relation of biochemistry to medicine and its problems. It should go far to make the study of biochemistry attractive and understandable to the medical student. Its size and low cost should also have an appeal.

◆ ◆

Urological Diseases of Pregnancy

By E. Granville Crabtree, M.D., Urologist to the Boston Lying-in Hospital. With a signed chapter by George C. Prather, M.D., Assistant Urologist to the Boston Lying-in Hospital. Little Brown & Company, Boston. 1942. Price, $6.50.

A book on this subject is opportune now chiefly because of increased interest in the problems of the kidney during pregnancy and childbirth; and also, because of the studies and advances in the field of endocrinology and in the field of physiology accomplished during the last decade. This book makes available for clinicians generally, and for obstetricians and urologists especially, a great fund of knowledge not readily accessible in the general carrying-on of their practice. From all the world's literature the author has collected data published during the century which has elapsed since the first major advancement in the study of urinary changes and diseases of pregnancy (1841). In this connection, Dr. Crabtree has included in the work a most exhaustive bibliography.

In addition to the references appended to each chapter, there is a 74 page bibliography containing several thousand references culled from the world's literature.

Credit must be given to the publishers for their part of the work, especially the fine reproductions of the illustrations and the easily read type.

◆ ◆

Surgery of the Ambulatory Patient

By L. Kraeer Ferguson, M.D., Assistant Professor of Surgery, University of Pennsylvania. With a section on Fractures by Louis Kaplan, M.D., Associate in Surgery, University of Pennsylvania. J. B. Lippincott Company, Philadelphia. 1942. Price, $10.

The lesions discussed in this book are those which are met regularly in the office or in the outpatient clinic. The author describes the best method of treatment as proved by personal experience. The book is divided into three parts: I.—general discussion; II.—regional surgery; III.—fractures and dislocations. A good book for the young doctor and the general practitioner.

◆ ◆

Clinical Application of the Rorschach Test

By Ruth Bochner, A.M., and Florence Halpern, A.M., with an introduction by Karl M. Bowman, M.D., Professor of Psychiatry, University of California Medical School. Grune & Stratton, New York. 1942. Price, $3.

Methods of Treatment in Postencephalitic Parkinsonism

By Henry D. von Witzleben, M.D., Elgin State Hospital, Elgin, Illinois. Preface by Theodore J. C. von Storch, M.D., Associate Professor of Neurology, Albany Medical College. Grune & Stratton, New York. 1942. Price, $2.75.

A comprehensive review of numerous therapies with a brief evaluation of each. The Bulgarian root treatment, combined with physiotherapeutic measures, is favored by the author.

◆ ◆

Internal Medicine in Old Age

By Albert Mueller-Deham, M.D., formerly Clinical Professor of Internal Medicine, University of Vienna, and S. Milton Rabson, M.D., Assistant Professor of Pathology, New York Post-Graduate Medical School. The Williams & Wilkins Company, Baltimore. 1942. Price, $5.

A general introductory section, devoted to the status, problems, difficulties, and other broad components of geriatric medicine precedes the detailed clinical discussion of diseases characteristic of senescence and of the peculiarities, in advanced age, of diseases common to any period of life.

The primary emphasis is on diagnosis and treatment. Diagnostic features and complications are brought out that are unique to the last stages of life. Therapy is shown to be more efficient and to have a wider scope than is generally assumed.

◆ ◆

Textbook of Surgery

By American Authors, edited by Frederick Christopher, M.D., Associate Professor of Surgery, Northwestern University Medical School. Ed. 3. W. B. Saunders Company, Philadelphia. 1942. Price, $10.

Completely revised with new sections on gastric ulcer, anal pruritus, hemorrhoids, abnormalities of the thymus, compound fractures, war injuries and coccidioidal granuloma. The latest uses of the sulfonamides in surgical diseases are given.

◆ ◆

Functional Neuroanatomy

By Wendell J. S. Krieg, Ph.D., Assistant Professor of Anatomy, New York University College of Medicine. The Blakiston Company, Philadelphia. 1942. Price, $6.50.

This new text presents the study of functional neuroanatomy from the systemic point of view. The sensory and motor neurons are first considered to show the fundamental principles of neural structure and function. The primary neurons of the cranial nerves are logically studied in their natural grouping—by their functional components within the brain stem. The sensory systems which have strong suprasegmental connections are next considered and, following this, the motor pathways. The more complicated connections and associations of the cerebrum are next described, and the cerebellum with its connections to all levels is taken up last of all the parts of the cerebrospinal system. Excellent illustrations accompany the descriptions of each system. There is an atlas of sectional reconstructions of the cord, brain stem and brain which is referred to repeatedly throughout the text, and which is helpful in forming a mental picture of these structures. Laboratory work is carefully planned and correlated with the text matter.

◆ ◆

Endocrinology: Clinical Application and Treatment

By August A. Werner, M.D., Assistant Professor of Internal Medicine, St. Louis University School of Medicine. Ed. 2. Lea & Febiger, Philadelphia. 1942. Price, $10.

This work in its revised edition, covers the entire field of endocrinology. Every section of the book has been rewritten. The number of illustrations has been correspondingly increased as have the references to the literature which now number nearly two thousand. The book offers the general practitioner safe and conservative information on both the diagnosis and the treatment of endocrine disturbances. It is written from the internist's point of view and presents a scientific and yet practical survey of all that is known of this subject. The style is lucid, simple and direct and the illustrations are excellent and numerous. Case histories, both from the author's own practice and from the literature, are liberally distributed throughout the text. The author not only stresses the possibilities of endocrinology, but he also points out the limitations of our knowledge. The emphasis on the clinical aspects of endocrine disorders and the physiology of the endocrine glands make this book unique in this field.

◆ ◆

Nephritis

By Leopold Lichtwitz, M.D., Clinical Professor of Medicine, Columbia University. Grune & Stratton, New York. 1942. Price, $5.50.

This book explains a method of analyzing renal function and urinary excretory capacity in a simple manner. The method yields full information as to diagnosis as well as prognosis. It also explains how to prescribe an individually adequate diet both qualitatively and quantitatively, with due

regard for nitrogen and salt content, as well as for optimum fluid intake. Particular emphasis is laid on the systemic character of nephritis, a conception which permits of a better understanding of the nephritis-nephrosis problem and of the nature of the nephrotic syndrome.

◆ ◆

Electrotherapy and Light Therapy: With the Essentials of Hydrotherapy and Mechanotherapy

By Richard Kovacs, M.D., Professor of Physical Therapy, New York Policlinic Medical School and Hospital. Ed. 4; thoroughly revised. Lea & Febiger, Philadelphia. 1942. Price, $8.

This standard work reflects the progress which has been made in the employment of physical therapy. It gives a comprehensive presentation of the therapeutic use of electricity and light. It begins with the essential physics and then describes the devices for their production and their physical and physiological effects on the body. The indications and contra-indications and the possible dangers of each form of energy are fully described. The work includes those simple methods of treatment by water, exercise and heat which require no special equipment. Those methods which are playing such a large part in the treatment of disability and suffering following war injuries are also fully covered.

The section on electrophysics has been expanded to include modern vacuum-electronic devices. The relation of electro-diagnosis to the new electro-physiology is stressed. The latest progress in iontophoretic therapy has been included. Three chapters are devoted to the concise presentation of the physics, effects and clinical uses of short-wave diathermy. Three new chapters have been added to furnish the essential information about the employment of water, massage and exercise. The section on physical therapy has been considerably enlarged and the chapters on peripheral vascular disease, on chronic arthritis and on traumatic and skin conditions have been rewritten and amplified.

◆ ◆

Athletic Injuries

By Augustus Thorndike, M.D., Associate in Surgery, Harvard Medical School. Ed. 2. Lea & Febiger, Philadelphia. 1942. Price, $3.

The first part of the book covers briefly the anatomy and physiology of the human body as related to physical exercise. It points out the results and importance of training in preventing injury and provides specific procedures for such prevention. The second and third parts deal with specific injuries incidental to athletics. Their diagnosis and treatment are fully covered and the numerous tables and illustrations add greatly to the value of the text. The nature and frequency of injuries to the various parts of the body are analyzed from the point of view of a surgeon with wide experience in handling traumatic injuries on the athletic field and through the period of convalescence. This is a book of personal experience with interesting statistical tables and an extensive bibliography. Such topics as physical fitness, physical training, physical fatigue, sprains, strains, fractures and infections are fully covered. Special chapters deal with the shoulder, the arms, elbow and forearm, the abdomen, pelvis, back, knee and ankle.

◆ ◆

Anoxia: Its Effect on the Body

By Edward J. Van Liere, M.D., Professor of Physiology and Dean of the School of Medicine of West Virginia University. The University of Chicago Press. 1942. Price, $3.

The author reviews comprehensively the literature of anoxia to date. He takes up systematically and in detail the effect of anoxia on the blood, heart, and circulation and on the blood pressure, lymph, and respiration; the chemical changes in the body produced by anoxia; the symptoms and causes of mountain sickness and altitude sickness; acclimatization; the effects of anoxia on the alimentary tract, on the secretion of the kidneys, and on the endocrine glands; its effects on oxidative and nitrogen body metabolism, on nutrition, on heat regulation, and on the water distribution of the body. He also examines the effects of anoxia on the nervous system.

◆ ◆

Psychiatry in Medical Education

By Franklin G. Ebaugh, M.D., Professor of Psychiatry, and Charles A. Rymer, M.D., Associate Professor of Psychiatry, University of Colorado School of Medicine. The Commonwealth Fund, New York. 1942. Price, $3.50.

The authors present a detailed picture of psychiatric teaching in the United States. Two aspects of the subject are considered: general psychiatric content in undergraduate training which seeks to inculcate the principles and viewpoints that should be a part of the armamentarium of every general practitioner, and graduate psychiatric training which is designed for those who plan to specialize in this field.

The book deals with the problems of psychiatric teaching today, the ways in which various schools have set about solving them, and the progress that has been made in the past decade. The experience in certain schools is set forth in detail. From this extensive study, the authors offer suggestions to guide the future development of psychiatric teaching.